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Organization Is Key To Broader Service of Machine Tools

By E. L. Shaner

Editor, Iron Trade Review

RAPID rise in the American standard of living has focused the eyes of numerous investigators upon the economic structure of the United States. Many have sought an explanation of the phenomena of widespread diffusion of wealth which is evidenced by the operation of 25,000,000 automobiles, the use of electricity in 17,000,000 homes, the ability of parents to send nearly four million children to high school and more than a million youths to college, and the almost general enjoyment of luxurious facilities and services beyond the bare requirements of food, shelter and clothing.

The majority of authorities attribute this condition of broad public well-being to the increased productivity of the nation. The committee on recent economic changes of the President's conference on unemployment concludes that acceleration rather than structural change "is the key to an understanding of our recent economic developments." The committee believes that "the distinctive character of the years from 1922 to 1929 owes less to fundamental change than to intensified activity."

Digging deeper into this and other exhaustive reports, we find the increased "breadth, scale and tempo" which characterize the present period are manifest chiefly in

1. Increased supply of power and its wider use.
2. Multiplication by man of his strength and skill through machinery.
3. More systematic arrangement of work in agriculture, mining, manufacturing and commerce.
4. Increasing the effectiveness of the foregoing by the intelligent use of capital.

All of these influences have been at work for many years, but the pres-

ent highly developed organization, by which their benefits are more quickly transmitted to civilization, is comparatively new. In fact, it may be said that the national ingenuity for efficiently applying these forces to the needs of modern civilization is at the root of our good fortune.

Machinery Is Keystone

If one takes the trouble to study this fine co-ordination of factors contributing to prosperity, he cannot proceed far without recognizing the keystone position of power and machinery in the economic structure. They constitute the basis on which

Fountain Heads of

are erected all modern conceptions of production, distribution and sales. They are responsible for mass output and mass consumption—two important feeaturs characteristic of the present age.

Power and machinery go hand-in-hand, but neither could have attained the high station in industry it now holds if it were not for machine tools. In the early days of the steam engine, its full possibilities were not utilized because of the lack of suitable tools for shaping cylinders, pistons and other parts. The first crude lathe was a boon to power, and in the passing years, each new development in tools meant a corresponding refinement in the design of prime movers.

Machine tools were of little importance prior to the beginning of the nineteenth centry. The earliest metal-cutting machines were developed abroad, particularly in England, but during the past century American inventors have made important contributions. The development of the milling machine, automatic lathe, turret lathe and grinding machine is attributed to American tool designers. All four have been practically indispensable in the gradual evolution of interchangeable manufacture and mass production. In recent years, American designers have taken the lead in the creation of new machines, and today machine tool builders enjoy markets the world over.

According to the report of the bureau of the census, the machine tool industry in 1927 comprised 355 establishments, employing about 35,000 wage earners. The industry spent 52 million dollars in wages and 46 million for materials, and manufactured products valued at 159 millions of dollars.

Volume of Business High

During the past few years the industry has enjoyed a gratifying volume of business. The index of the value of new orders compiled by the National Machine Tool Builders' association, for which the average monthly shipments for 1922, 1923 and 1924= 100, averaged 237 throughout 1928, and continued on its upward rise to 330 in April, 1929. From that peak it dropped to 284 in August.

It is almost inconceivable that this comparatively small industry should figure so prominently in the welfare of the nation. Unfortunately, no figures are available which evaluate adequately the service of machine tools to modern civilization. The nearest approach lies in the compilation of statistics in the 1929 edition of *Commerce Yearbook:*

Year	Wage earners	Primary horsepower	Value added to materials
1869	2,054,000	2,346,000	$ 1,395,000,000
1879	2,733,000	3,411,000	1,973,000,000
1889	4,252,000	5,939,000	4,210,000,000
1899	4,713,000	10,098,000	4,831,000,000
1909	6,615,000	18,675,000	8,529,000,000
1919	8,998,000	29,324,000	24,803,000,000
1927	8,354,000	39,038,000	27,585,000,000

There are slight discrepancies in these figures, due to changes in the method of compiling the census of manufactures in certain years, but the data are sufficiently comparable to present a picture. They show, for instance, that in 1869 each worker had at his command one horsepower. In 1927, the average worker was assisted by the equivalent of nearly 4.7 horsepower. In 1869 the value added to materials per wage earner was about $700; in 1927 it was $3300. The value added to materials per horsepower in 1869 was slightly less than $600, and in 1927 it was a little more than $700. The greatest increase in these figures is apparent in the decade from 1909 to 1919, when primary horsepower increased approximately 60 per cent and value added increased over 200 per cent.

The increase in the ratio of horsepower to wage earners is interesting in that the greatest acceleration has come within the past decade. This is

shown in the following tabulation:

Year	Horsepower per wage earner	Increase
1869	1.1	.....
1879	1.2	+0.1
1889	1.4	+0.2
1899	2.1	+0.7
1909	2.8	+0.7
1919	3.3	+0.5
1927	4.7	+1.4

Thus the increase in use of power per worker has been as great in the eight years from 1919 to 1927 as in any previous 20-year period. This substantiates the statement of the committee, quoted at the beginning of this article, to the effect that the economic changes of recent years have been in acceleration rather than in the introduction of new elements.

Another means of judging the influence of machine tools upon industry is to follow the trend of the production of machinery. The group, designated as "machinery industries" by the bureau of the census, comprises industrial machinery (foundry and machine shops, engines and water wheels, machine tools and other metal-cutting machinery, pumps, textile machinery, gas and water meters and mechanical refrigerators); electrical machinery, apparatus and supplies; office machinery and appliances; agricultural equipment; and miscellaneous including washing machines, sewing machines and numerous other items. It will be understood readily that progress in these manufacturing industries is predicated largely on the application of machine tools.

The value of products of this group was a billion and a half dollars in 1914. In 1927 it had jumped to $5,367,808,000, an amount equal to one-sixteenth of the aggregate national income. The total in 1927 was three and one-third times that of 1914. The value of industrial machinery trebled from 1914 to 1927, while that of electrical machinery multiplied nearly five times.

Acceleration Is Feature

When the figures for 1929 are available, it is likely that the gains of that year over 1927 will exceed those registered in many previous 10-year periods. In other words, acceleration will prove to be the feature in the machinery industries, just as it has been in other economic trends.

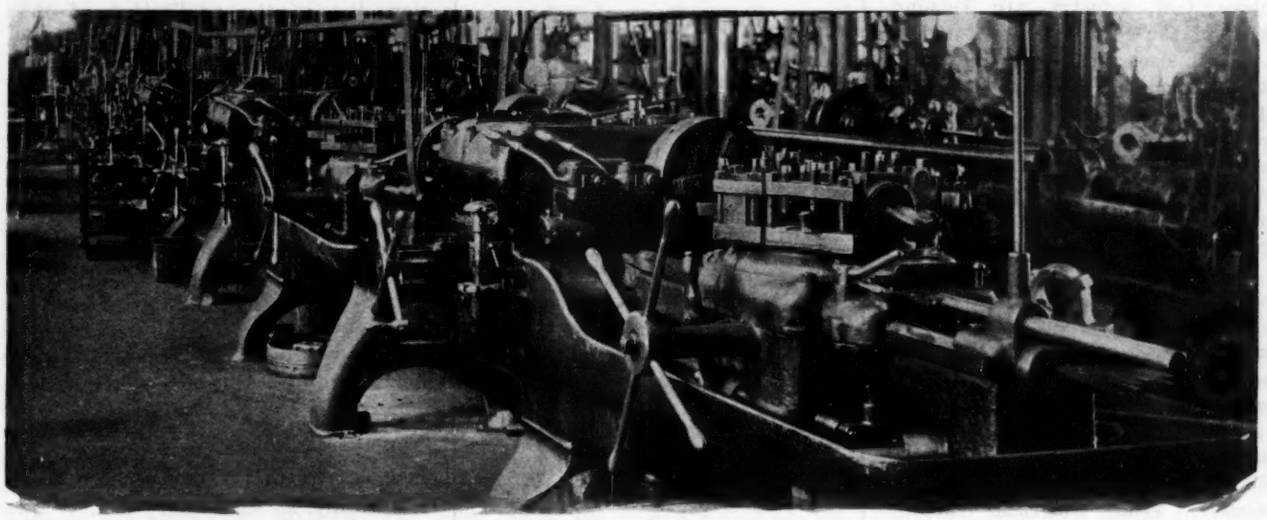
This brings us to a point where we must abandon statistics and rely on general observations. It is pretty well established that the quickening of activities is the distinctive characteristic of the past few years. Granting that this is true, we next are interested in knowing to what extent machine tools have helped in increasing this economic tempo.

The experience of the automobile industry in connection with the use of machine tools is well known to all. In 1900 the manufacture of automobiles was in its infancy. During most of the following decade the methods employed were largely those which had been developed in machine shops of other industries. Gradually, however, as production began to mount, automotive engineers experimented with various plans for expediting output. Out of this development emerged such important contributions to the American system of manufacturing as the specialization of machine operations, the use of special-purpose machines, and the assembly line.

These and other practices, all distinctly developments within the automotive industry, have revolutionized the manufacture of numerous products. The automotive industry has been the proving ground for experiments in machine tool application.

Thus, when some of the newer industries came to the stage where mass production was required, it was a simple matter to adopt, almost in entirety, the methods proved in the automotive industry. For instance, there was little lost motion in the production of radio sets when the demand leaped to surprising volume a few years ago. With few exceptions every

Mass Production



"THE turret lathe and the full automatic lathe are distinctly American in their origin and development. They are the most important tools of the semiautomatic and full automatic type that are used in general machinery manufacturing where quantity production is possible."—

Dexter S. Kimball, dean, College of Engineering, Cornell university, in "A Century of Industrial Progress."

mechanical problem encountered in radio manufacture already had been met and its solution worked out previously in automobile manufacture.

The production of airplanes and aeronautical motors has increased rapidly since 1927. The radial, air-cooled engines, which now constitute 80 per cent of the aircraft engines manufactured, involve many intricate machining operations. However, everything required for these motors already has been made available by the automobile industry.

The point of this is that many of the products recently placed on the market for mass consumption—such as electrical refrigerators, washing machines, sewing machines, etc.—have been afforded the advantages of mass production without having been obliged to contribute to its development.

Keep Pace With Requirements

Today the engineering forces of the machine tool industry are keeping abreast of the requirements of industry. This does not mean, however, that new models are created and introduced promiscuously. More and more builders are coming to a realization that a new model should be placed on the market only when it will do work better, easier or more cheaply than any existing machine and when the demand for it is sufficient to compensate the builder adequately for his effort in designing, developing, manufacturing and marketing it. Closer adherence to this policy is checking the introduction of unnecessary machines, without interfering with the ability of the industry to fulfill the real requirements of its customers. Today American machine tools are offered in such number and variety that users ordinarily experience little difficulty in finding one that is suited to their needs. If, as frequently happens, a new or unusual machining operation is encountered, the chances are good that it can be performed by an existing machine, with slight modifications to adapt it to the specific requirements.

With the machine building industry functioning more smoothly than ever before and with its proved capacity and ability to supply the equipment so essential in this machine age, we may shift our attention to the future. What, we may ask, is the next logical step in the machine tool builders' program of service to industry?

Unquestionably the next move is to accomplish certain things that can be brought about only through better co-ordination of forces within and without the industry. The first problem is that of promoting better teamwork among the builders; the second is that of improving the relations between the builders and those who furnish materials and parts for machines, and also with those who use machines.

The problem of internal relations already is well on its way to solution. Through the continued efforts of the National Machine Tool Builders' association, the companies comprising its membership gradually are attacking certain evils that has retarded the progress of the industry. During the past few years a number of groups within the association have established standards which will save hundreds of thousands of dollars for machine tool users. The adoption of standardized spindle noses and arbors for milling machines is an impressive example of what can be accomplished in this direction. Other groups are at work on similar programs, the results of which will be beneficial to the entire machine-using branch of industry. Uniform cost accounting, more intelligent practice in connection with engineering service and numerous other activities of the association constantly are adding to the ability of each company to conduct its affairs more efficiently.

However, the greatest opportunity for the broadened service of machines lies in the external relations of the builders. There is room for improvement in the co-ordination of the effort of those who supply castings, forgings, carbon and alloy steel, cutting materials, motors and other electrical equipment. plain and antifriction bearings, etc., with that of those who build the machines. Similarly, there is need of closer contact between these two groups and the users of machines.

Two examples will suffice to illustrate the necessity of this co-ordination. For years electric motors were applied to machine tools before any concerted effort was made to establish an understanding regarding certain essential dimensions which would simplify design and construction. Recently steps were taken to work out standards for the spacing of holes for mounting bolts and for the distance from base to center of armature shaft. When these details are worked out successfully, the machinery industries will be benefited to the extent of many thousands of dollars.

Another opportunity for effective teamwork, and one which illustrates the advantages that would accrue if all factors in a situation could be brought together in harmonious action, lies in the application of the comparatively new tungsten-carbide and other improved cutting materials. Numerous authorities have declared that these cutters may exercise as much influence on the design and use of machine tools as did the introduction of high-speed steel by Taylor and White, a generation ago. If the application of Carboloy, Widia, Hastellite and other new materials is left to the fate of the trial-and-error method which marked the application of high-speed steel, the metalworking industries will squander millions of dollars in futile duplication of effort.

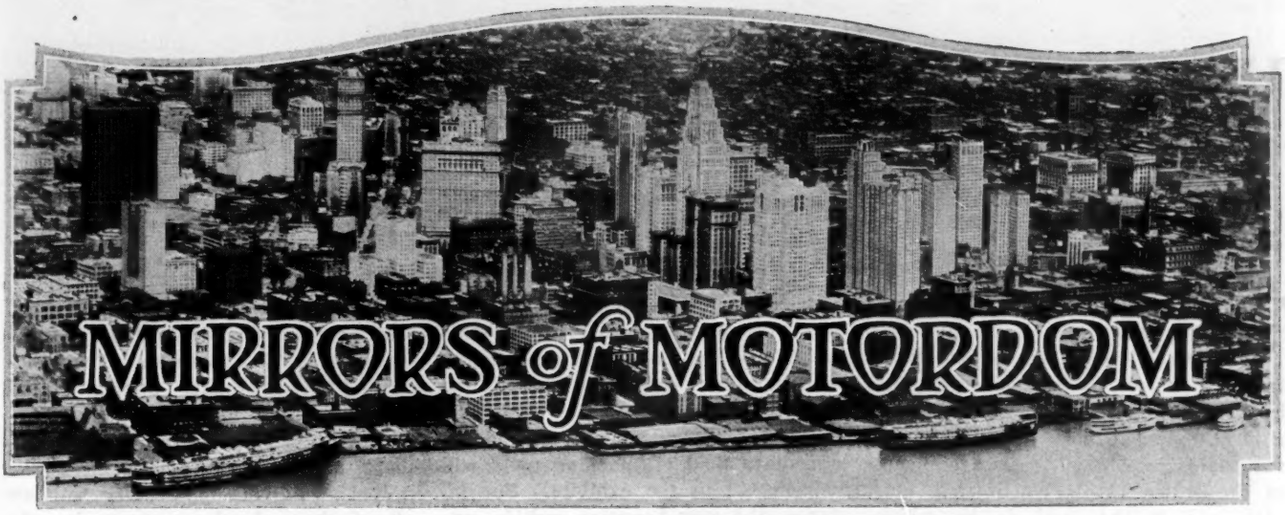
Suggests Study of New Tools

Why not attack this problem systematically, as suggested by E. F. Du Brul, general manager of the National Machine Tool Builders' association? He has suggested that a research organization, supported by producers of the cutting materials and by builders and large users of machine tools, be established to study the effect of these new tools and to recommend the changes in design and changes in machine shop practice required for their successful application. It is believed that a half-million dollars, or more, wisely expended in this way, would save many times that amount in costly mistakes that necessarily will be made if each individual company affected by the new discoveries tries to work out its own solution of the problems.

This is only one of many situations which calls for united action. From now on, the greatest advances in the service of machinery to civilization will come from acceleration of activities, brought about by more effective harnessing of important influences.

Co-ordination a Task for the Future

MACHINE tools already have contributed so much to America's economic supremacy that their prestige is unassailable, but if in the year to come, we as a nation are to extend their service in a degree commensurate with their latent possibilities, we must co-ordinate the factors which influence their application. This means a further breaking down of the barriers between producers of materials, builders of machine tools, and manufacturers who rely on machines for production.



Look for Only Average Auto Output Rest of Year

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Ford Changes Near; Watch Steel Mergers Closely

Detroit, Sept. 17

EXTERNALLY the automotive industry is making a showing of great activity. More new models have been introduced since July 1 and are in prospect by January show time than in any previous last half year. The pains of swinging into production on new designs are poignant, as usual, and call for much co-operation between automotive engineers and material suppliers.

But for iron and steel producers this bustle does not mean tonnage. For several months Ford has been the Atlas of the automotive industry, and now he has relinquished part of the load. Chevrolet, Whippet, Pontiac and Hudson-Essex, of the large-scale producers, also are curtailing. A few manufacturers like Buick, Hupp, Packard, Graham-Paige and Cadillac-LaSalle are going strong on new lines, but they do not begin to fill the void.

Neither retail stocks of new cars nor accumulations of used cars could be described as excessive for the season, but the industry is becoming blanketed by the opinion that the country has absorbed about all the gasoline transportation it can be expected to in a year. There is talk that production of cars in the last quarter will be about "average." If that be true, then production is due for a sharp reduction the remaining months of the year.

The most recent official pronouncement on automobile production by the department of commerce at Washington was 500,331 units in the United States in July. August figures are expected to show no marked change. It is believed that the September rate, for the United States only, is not over 450,000 units. The industry will come up to Oct. 1 with about 4,700,000 units to its credit.

Several steelmakers report specifications thus far in September exceed the comparable period of August, but most makers have barely equalled the August rate. Especially is this true in sheets, specifications for which have not come back since Labor Day. Thus far demand for steel for conversion into cars next month does not augur well. It is the comparison with the record months of 1929 that hurts; compared with previous years, the showing is not bad.

* * *

FORD now appears to have reached the zenith on Model A, current series, with a total of 205,634 units, domestic and foreign, in August. Retail sales in August approximated 167,000 units and dealers' stocks are negligible. Thus far in September, however, a reduction from August is indicated. The 6-day week for equipment has been dropped, and men and machines alike—save only the continuous processes—are back on a 5-day week schedule. September is only a 24-work-day month, against 27 days in August.

There is good ground for the belief Ford in a modified way is joining the ranks of the model-changers. Ford specifications for steel are being curtailed, accumulated stocks of materials are being used up and only 170,000 units are scheduled for October in anticipation of important body changes. The radiator, it is understood, will be higher. There will be a longer hood and a higher cowl. Some of the curve will be taken out of the front fenders and some of the running board splash shield will be incorporated in the fenders. The new large-hub type of steel-spoked wheel will be standard.

Mechanically, it is expected there will be few changes, as the Model A motor has been going through a constant process of refinement. By the time the new bodies are in production it is expected that about 2,600,000 Model A's will have been made. On model T Ford had a run of 15,000,000, but the last Model T assembled was quite a different car than the first. Chevrolet, which made 109,968 units in August and has dropped to about 95,000 this month, is also entering a period of model changing, and it may be that the sharpest competitors of the automotive industry will have new cars to offer almost simultaneously.

* * *

DETROIT, still intensely eager for steel production commensurate with its consumption, is closely watching the merging of independent steel companies by the Eaton-Mather-Mellon group. Acquisition of control of the Donner Steel Co., Buffalo, a factor in the bar and alloy steel markets here, by this group is expected to result in its affiliation with the Central Alloy Steel Corp. The Otis and Bourne-Fuller companies at Cleveland are expected to figure in the merger news shortly.

The automobile industry naturally

(*Concluded on Page* 734)

What the Machine Tool Exposition Means to Industry

TWO years have elapsed since the first National Machine Tool Builders' exposition was held. In that period marked improvements have been made, not only in the design of machine tools, but also in the materials from which they are made, in the cutting tools which they employ and in the methods by which the machines serve industry. In fact, it is safe to say that greater progress has been made since 1927 in the development of machines and in their application than in any previous 2-year period.

This accelerated advance may be attributed to several factors, one of the most important of which is the high rate of activity that has prevailed in the industries which use metal-cutting machinery. Continued high production in the automotive, electrical, radio, refrigerator, aeronautical, steel and other branches not only has been responsible for lifting the index of machine tool sales to the highest marks in history, but also has stimulated the introduction of new models.

Co-operation Is Helpful

Another contributing factor to progress is the greater degree of co-operation that has marked the activities of machine tool builders during the past few years. For the first time in the long series of attempts to standardize certain parts, they have met an encouraging measure of success. A number of standards have been adopted and put in practice, and others are in process of being established. The spirit of willingness to work collectively on problems of this kind is significant. It reflects a tendency among machine tool builders to utilize the latent opportunities afforded by their organization—the National Machine Tool Builders' association—more extensively than heretofore.

The full force of these favorable influences is bound to manifest itself in the approaching exposition. For months there have been signs of unusual activity in the preparation of new machines and accessories, many of which will be shown for the first time at the Cleveland exposition. Enough is known of the character of these displays to warrant the statement that more equipment of new design will appear on the floor of this exposition than has been seen in any other similar show in the United States.

Many new developments beyond the immediate field of machine tools will be reflected in the exhibits. For instance, the new tungsten-carbide cutting materials, as well as numerous other improved tool alloys, now have been employed in the United States long enough to begin to influence the design of certain details in metal-cutting machinery. The first tendencies toward heavier tool carriage construction will be clearly evident. Likewise, demonstrations of how greater rigidity, absence of chatter and reduction of troubles due to the traditional type of tail stock center may be accomplished are sure to attract attention.

Concurrent with the development of better cutting tools has been a marked advance in rolled steels, forgings, castings and other products used in the construction of machine tools. Nitrided steels, numerous corrosion-resisting alloys and an array of high-strength gray iron and heat-treated steel castings have gained prominence since the 1927 exposition. The tendency toward broader application of these improved materials will be apparent to all who examine the displays at Cleveland.

Just what the opportunity to view all of these developments under the ideal conditions afforded by the exposition means to the personnel of the manufacturing industries can be indicated in some measure by the experience of the 1927 show. At that time large companies, such as General Electric, General Motors, Ford Motor, International Harvester, Illinois Steel, American Locomotive, Western Electric, National Cash Register, American Car & Foundry, Westinghouse Electric, Frigidaire, Ingersoll-Rand, Bethlehem, Pennsylvania railroad, etc., sent large delegations of executives, engineers, and operating officials to study the machines and accessories displayed. Based on the number of such individuals who visited the show in 1927, it is estimated conservatively that 12,000 will attend this year's exposition. This, of course, is in addition to the 3000 representatives of exhibiting companies who will be on hand. It is evident, therefore, that the benefits of the show work two ways. The builders are afforded an opportunity to show their wares to the cream of the machine tool consuming industries; the representatives of these industries are given a chance to view all the important developments in machines and appurtenances at a minimum outlay of time, travel, and expense.

Sponsored By Association

Among the salient facts concerning the show are the following: It is sponsored by the National Machine Tool Builders' association, whose president, Henry Buker, and general manager, E. F. Du Brul, have been active in connection with policies and plans. The show is under the direction of the committee named elsewhere in these pages. Installation of equipment will take place Sept. 22-29. The exposition days will be Monday, Tuesday, Wednesday, Thursday and Friday, Sept. 30 to Oct. 4, inclusive. About 260 separate displays, occupy-

Who's Who in Show Management

Exposition Committee

J. WALLACE CARREL, Chairman
Lodge & Shipley Machine Tool Co., Cincinnati

P. E. BLISS
Warner & Swasey Co., Cleveland

RALPH E. FLANDERS
Jones & Lamson Machine Co., Springfield, Vt.

ROBERT M. GAYLORD
Ingersoll Milling Machine Co., Rockford, Ill.

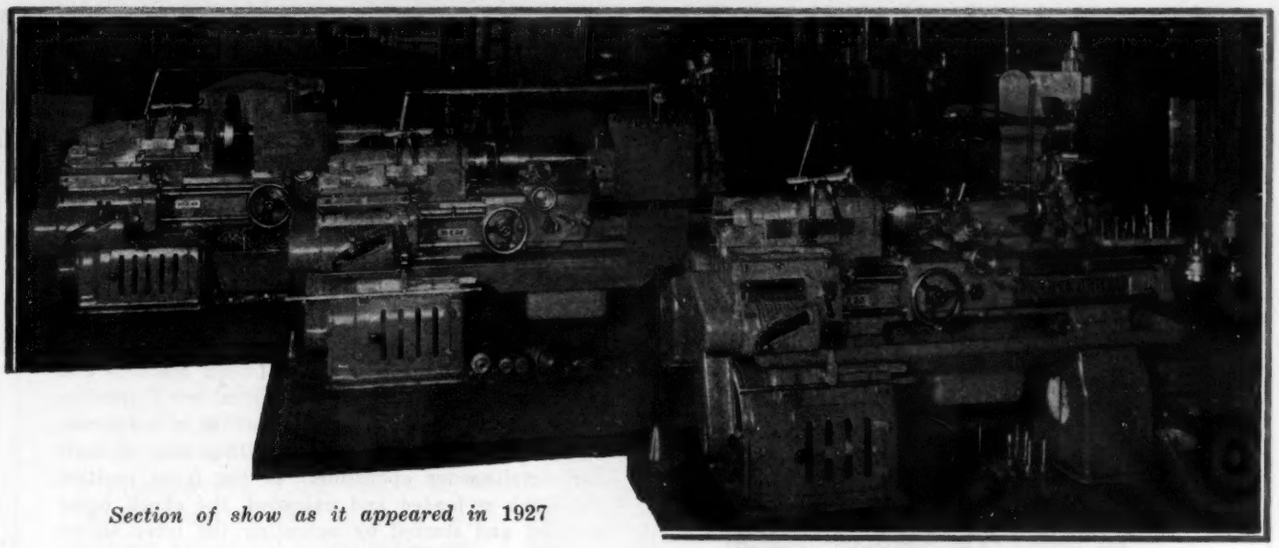
JAMES E. GLEASON
Gleason Works, Rochester, N. Y.

Ex-Officio Member

HENRY BUKER
Brown & Sharpe Mfg. Co., Providence, R. I.

Exposition Manager

ROBERTS EVERETT
225 West Thirty-fourth street, New York



Section of show as it appeared in 1927

ing 91,351 square feet of floor space, constitute the exposition. These exhibits will be in the Cleveland auditorium unit, comprising the main building, annex and arcade. The equipment will require the equivalent of 400 standard railroad cars for transportation. Meetings of the Machine Tool congress, machine shop section of the American Society of Mechanical Engineers and production division of the Society of Automotive Engineers will be held evenings during the show week, as outlined in detail on page 717.

Directory of Exhibitors and Their Exhibits

ABRASIVE MACHINE TOOL CO., East Providence, R. I.—No. 3 surface grinder, 22x8x12-inch; No. 33 surface grinder, vertical spindle, 22x7x12-inch; No. 5 surface grinder, 48x14x14-inch; dust exhaust attachment; wet grinding attachment; magnetic chucks; self-contained D. C. generator; dial test indicator; 8-inch index centers; 8-inch semi-direct index centers.

ACME MACHINERY CO., Cleveland.—Acme all-steel bolt heading, upsetting and forging machine; bolt threading machine, cutitng standard style of thread; semi-automatic nut threading machine; nutting-up machine.

ACME MACHINE TOOL CO., Cincinnati.—17 and 4-½inch Cincinnati Acme full universal hexagon turret lathe; No. 1 Cincinnati Acme semi-universal hexagon turret lathe.

AHLBERG BEARING CO., 317 East Twenty-ninth street, Chicago.—"CJB" Master ball bearings; Ahlberg ground bearings.

ALLEN CO., CHAS. G., Barre, Mass.—Sensitive ball bearing drilling and tapping machines.

ALLIS-CHALMERS MFG. CO., Milwaukee.—"Texrope" speed reduction unit in operation; totally enclosed fan cooled motor; squirrel cage induction motor; direct current machine tool motor.

AMERICAN BROACH & MACHINE CO., Ann Arbor, Mich.—Hydraulic, vertical and horizontal broaching machines; broaching tools; hydraulic presses.

AMERICAN TOOL WORKS CO., Cincinnati.—Lathes; radial drills; shapers—all motor driven.

ARMSTRONG-BLUM MFG. CO., Chicago.—"Marvel" metal band sawing machine; automatic high speed saw; hack sawing machines; high speed edge hack saw blades.

ARMSTRONG BROS. TOOL CO., 317 North Francisco avenue, Chicago.—Lathe, planer and shaper tools; lathe dogs; clamps; ratchet drills; drop forged wrenches; pipe vises; pipe cutters; stocks and dies; pipe wrenches; machine shop specialties.

ARTER GRINDING MACHINE CO., Worcester, Mass.—12-inch rotary surface grinder with magnetic chuck, wet grinding equipment, including pump and tank, arranged for motor drive complete with motor; No. 132 automatic cylindrical grinder with wet grinding equipment including pump and tank, with complete tooling for grinding valve stem guides, arranged for motor drive compete with motor.

ASSOCIATED MACHINE TOOL DEALERS, 551 Washington boulevard, Chicago.

ATKINS & CO., E. C., 402 South Illinois street, Indianapolis.—No. 18 Kwik-Kut power hacksaw; No. 7 Kwik-Kut power hacksaw; No. 4 metal cutting bandsaw; Silver-Steel hacksaw blades; Atkins hacksaw frames.

AUTOMATIC NUT-THREAD CORP., 3617 North Eighth street, Philadelphia.—No. 2 and No. 3 threading full automatic nut tapping machines; No. 1 single spindle tapping machine, full automatic; No. 1 hand tapping machine, single spindle; No. 7 single spindle semi-automatic.

AVEY DRILLING MACHINE CO., Cincinnati.—High Speed sensitive drilling and tapping equipment; drilling units; metal cutting saws; compensating jaw vises.

BAKER BROS. INC., Toledo, O.—No. 121 Baker heavy duty vertical drilling machine with "Texrope" motor drive; No. 25 H Baker vertical hydraulic feed five spindle six station indexing table drilling and boring machine; No. 25 HH Baker two way hydraulic feed drilling and boring machine; No. 10 H Baker vertical hydraulic feed drilling machine with adaptation for multiple heads; individual motor driven collant pump outfit.

BAKER-RAULANG CO., 2168 West Twenty-fifth street, Cleveland.—Model E3 3-ton elevating truck equipped with 1-ton swivel hoist; Model H3 3-ton Hy-lift truck.

BARBER-COLMAN CO., Rockford, Ill.—Type B production hobbing machine—a new high production gear generator; No. 3 hob sharpening machine—an automatic mechanically controlled hob and form cutter grinder; reamer sharpener—an automatic machine for highly accurate work under positive mechanical control; small tools; hobs, milling cutters, reamers.

BARNES DRILL CO., Rockford, Ill.—No. 214 multiple cylinder honing machine with hydraulically reciprocated spindles, all geared, self-oiling, all ball bearing; No. 249 self-oiling all geared honing machine with Timken roller bearings and eight quick changes of speeds; No. 242 self-oiling all geared drill and tapper with Timken roller bearings; two spindle No. 242 self-oiling all geared gang drill with Timken roller bearings; No. 221½ self-oiling all geared drill and tapper; No. 262 self-oiling all geared drill and tapper.

BARNES CO., W. F. & JOHN, Rockford, Ill.—Horizontal duplex long hole drilling machine; vertical motor driven oilgear feed drilling machines; vertical motor driven oilgear feed reaming machine with automatic indexing fixture.

BARRETT CO., LEON J., P. O. Box 44, Worcester, Mass.—Barrett centrifugal oil extractor, model 1200; centrifugal dryer, model 502; centrifugal washer, model 251; Stockbridge heavy duty backgeared shaper with patented two-piece crank.

BATH & CO., INC., JOHN, 18 Grafton street, Worcester, Mass.—Ground taps; thread gages; ground thread rolling dies; Bath internal micrometers; adjustable plain plug gages.

BAUSCH & LOMB OPTICAL CO., Rochester, N. Y.—Metallographic microscope; contour measuring projector; optical comparator; toolmakers' microscope; optical drill gage; internal and external profile gage; optical protractor; optical indexing device; (All precision optical instruments for production control.)

BESLY & CO., CHARLES H., 118-124 North Clinton street, Chicago.—No. 6-20-inch double spindle motor driven wet disc grinder; No. 309-30-inch vertical spindle motor driven wet disc grinder; No. 141-20-inch L type motor driven disc grinder; No. 5-18-inch F type motor driven disc grinder; bakelite abrasive discs and steelbac abrasive discs.

BIAX FLEXIBLE SHAFT CO., INC., 20 East Seventeenth street, New York.—Screw driving machine; drilling machines; portable flexible shaft grinders; rotary filing machines; rotary files; high speed grinders for die work; portable sanding and polishing machines; portable track grinders.

BLACK & DECKER MFG. CO., Towson, Md.—Universal portable electric tools; high cycle portable electric tools; Marschke grinders and swing frame grinders.

BLAKESLEE & CO., G. S., Chicago.—Blakeslee pump type parts washing machine; Niagara type parts washing machine.

BLANCHARD MACHINE CO., 64 State street, Cambridge, Mass.—Blanchard automatic surface grinder No. 16-A; 18-inch segment wheel; silicate wheels and segments; samples of Blanchard grinding.

BLOUNT CO., J. G., Everett, Mass.—Motor grinders—regular and high speed—tool or snagging; combination motor grinder and disc sander for pattern shops; wet tool grinders; motor buffers; pattern maker's lathe—eight speed, motor drive.

BOWEN PRODUCTS CORP., Auburn, N. Y.—Bowen system of lubrication for industrial machinery.

BOYE & EMMES MACHINE TOOL CO., 2245 Spring Grove avenue, Cincinnati.—16-inch x 6-foot coneless geared head lathe; 16-inch head only.

BRADFORD MACHINE TOOL CO., Eighth and Evans street, Cincinnati.—18-inch Brad-

(*Continued on Page* 716)

New Designs Will Feature Show

New Gear Burnisher Will Handle 12-Inch Gears

A NEW gear burnisher will be displayed prominently at the booth of the Cincinnati Shaper Co., Cincinnati, an illustration of which is presented above. Gear burnishers previously made by the company handled gears up to 7 inches in diameter while the new machine will accommodate gears up to 12 inches in diameter, and may be arranged to take even larger gears. A noteworthy feature of the machine is a special method of counterweighting employed.

Shows Gear Cutter

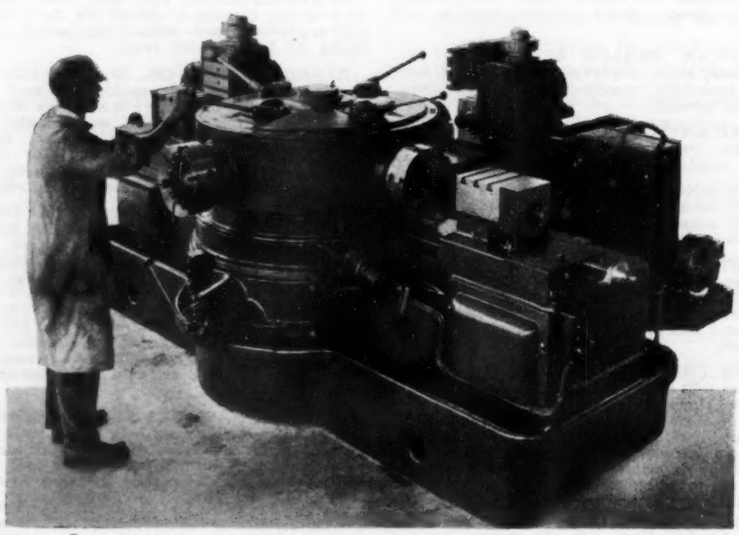
GLEASON WORKS, Rochester, N. Y., is showing for the first time a new small size spiral bevel gear generator, having a capacity for gears of 3⅜-inch pitch diameter, ½-inch face and 1¾-inch cone distance at 4 to 1 ratio. The machine employs the generating principle in which the work and cutter are rolled relatively to each other during the cut. The company also is showing a new testing device, used as a comparator to insure that the blades in circular cutters are mounted to have identical cutting angles.

Exhibits Work-Rotating Multiple Spindle Chucking Machine

ILLUSTRATION below shows a new work-rotating chucking machine which will be exhibited at the booth of the Goss & De Leeuw Machine Co., New Britain, Conn. Four horizontal work spindles are set radially 90 degrees apart in a horizontal turret and present the work to three sets of tools for simultaneous operation. In the front position the work is loaded and unloaded, the chuck being stopped and started by operating the lever shown just above it. This lever controls the driving gear in the work, having three positions. The neutral position stops the spindle; raising the lever engages a metal cone friction for picking up the initial load; dropping the lever into the lower position engages a dog clutch which furnishes a positive spindle drive.

Work spindles are driven by the main motor which is designed to transmit 25 horsepower. The spindles revolve simultaneously at the same speed; a two-to-one back gear furnishes a fast or slow speed for each combination of the quick change gears. Spindle speeds from 16 to 525 revolutions per minute can be obtained. A 5-horsepower motor furnishes drive for turret indexing and all the feeds on the main tool slides and cross slides. A third motor is part of a special revolving tool spindle attachment and, with the attachment, may be placed in any one or all of the three main tool slides. Coolant is circulated by an independent motor, a coolant reservoir being located in the base of the machine.

Both the main tool slides and the cross slides are actuated by solid barrel track cams, the slides being large and heavy for a multiple spindle machine, and by means of combining the two motions, heavy taper and forming cuts can be taken.



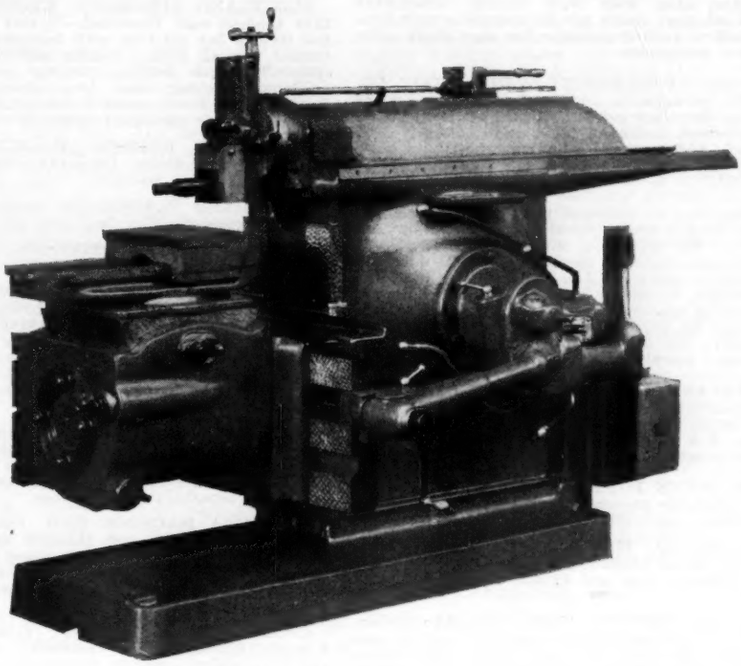
What You Will See at Cleveland

Shaper Is Equipped with Universal Table

CINCINNATI Shaper Co., Cincinnati, will show 24-inch heavy duty and 16-inch heavy duty shapers, both with built-in power rapid traverse to the table. The 16-inch shaper, shown in the illustration at the right, is equipped with a universal table, a revolving table with a tilting top, without hinges, jacks or table support. Cutting speeds have been increased considerably. A new combination tool tray and cross rail guard are integral parts of the unit which is furnished with tapered thrust bearings on each end of the cross feed screw, replacing the usual bearing method and making the table light to hand feed.

Ram bearings now extend to the end of the ram and reduce overhang from the cutting tool to the ram bearing by 2⅝ inches.

The 24-inch machine is equipped with a full box table in addition to the features of the 16-inch shaper and will be in operation, demonstrating its heavy and accurate cutting properties, combined with minimum of chatter.

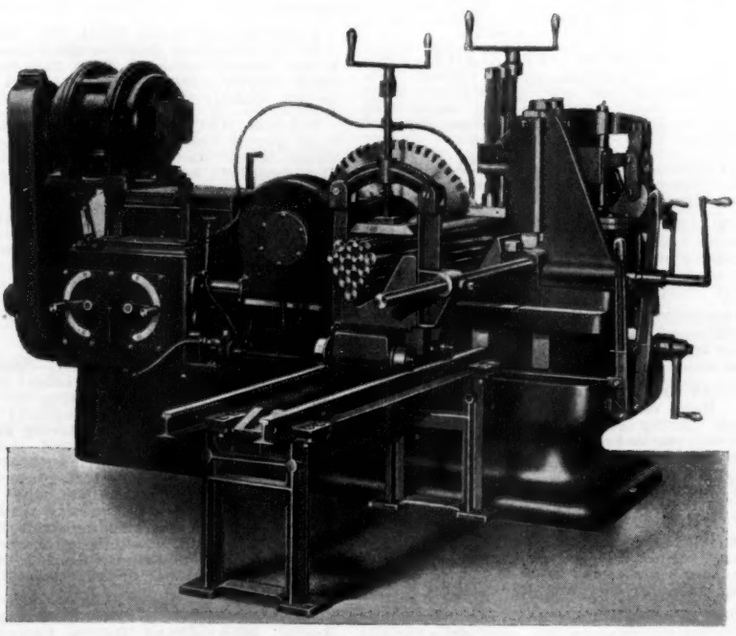


Four Feeds with 16 Changes a Feature of Metal Sawing Unit

THREE new metal sawing machines will be displayed at the booth of the Cochrane-Bly Co., Rochester, N. Y. All are motor driven and in operation. The intermediate size machine, shown in the illustration below, is driven through hardened nickel steel gears running in oil, with drive shafts mounted on roller bearings. The machine has four cutting speeds—42, 60, 75 and 90 feet per minute. It also is equipped with a geared feed having a range from ½-inch to 10 inches per minute, with 16 changes. The feed has a safety slip clutch to guard against breakage due to jamming of the carriage or other accident.

Drive is through a friction clutch operated from either the front or side position. The driving pulley and all driveshafts are mounted in roller bearings, worm thrust being taken up by a high-angle thrust bearing.

At the booth the machine will be equipped with a single compound toggle air clamp and multiple cutting fixtures. It will be demonstrated, as shown in the accompanying illustration, cutting round bars in multiple.



Directory of Exhibitors and Exhibits

(*Continued from Page 713*)

ford all geared patented lo-drive motor driven engine lathe, with taper turning attachment and oil pan; single spindle automatic unit type Bradford drilling machine for high speed automatic production.

BRIDGEPORT SAFETY EMERY WHEEL CO. INC., Bridgeport, Conn.—86-inch type No. 94 heavy duty face grinder, 42-inch sectional grinding wheel, hydraulic table drive; 20-inch steel chuck and sectional grinding wheel.

BROWN & SHARPE MFG. CO., Providence, R. I.—No. 2A standard universal milling machine; No. 4B standard plain milling machine; No. 2 standard vertical spindle milling machine; No. OY plain milling machine; No. 21 automatic milling machine; No. 2 universal grinding machine; No. 13 universal and tool grinding machine; Nos. 11, 30 and 32 plain grinding machines; No. 2 surface grinding machine; No. OOG automatic screw machine (high speed); No. 2 automatic screw machine (high speed); machinists' tools, cutters and hobs.

BRYANT CHUCKING GRINDER CO., Springfield, Vt.—No. 24 deep hole grinder with hydraulic slide traverse and automatic sizing; No. 12-A hole-face grinder; No. 3 heavy duty hole grinder; No. 3 standard hole grinder.

BUCKEYE PORTABLE TOOL CO., Dayton, O.—Portable pneumatic grinders, buffers, drills, sanders, screw-drivers, nut drivers.

BUFFALO FORGE CO., Buffalo.—Power drills; power bending rolls; combination punches and shears, fans and exhausters, all in operation.

BUHR MACHINE TOOL CO., Ann Arbor, Mich.—Buhr multi-head automatic drilling machines and automatic index tables; Buhr automatic piston drillers; Buhr drilling and tapping heads; Buhr universal adapters and drivers for drill presses.

BULLARD CO., Bridgeport, Conn.—8-inch Mult-Au-Matic center lathe; 6-inch four-spindle Mult-Au-Matic chucking lathe with hopper feed; 20-inch Auto-Matic vertical turret lathe; 36-inch "Spiral Drive" type vertical turret lathe.

CANEDY-OTTO MFG. CO., Chicago Heights, Ill.—Multiple spindle floor drill, motor driven; high speed motor driven drill press; 21, 17, 14, and 15-inch sliding head motor driven drill presses (all floor drills).

CARBOLOY CO. INC., 350 Madison avenue, New York.—Carboloy cutting tools for high production machining of ferrous, nonferrous and abrasive metals and materials; dies for wire drawing and extrusion work for routine high tonnage production in wire mills.

CARLTON MACHINE TOOL CO., Cincinnati.—8-foot 11-inch column heavy duty radial drilling machine; 6-foot 19-inch column all ball bearing heavy duty radial drilling machine.

CHICAGO BELTING CO., 113 North Green street, Chicago.—Motor drive belts; flexible idler belts; line and counter shaft belts; charts on belt ratings and belt properties; leather belting; hydraulic and pneumatic leathers; leather packings; leather tannages; motion picture illustration of how leather belt is made.

CHISHOLM-MOORE HOIST CORP., Tonawanda, N. Y.—Electric hoists and trolleys; chain hoists and trolleys.

CINCINNATI BICKFORD TOOL CO., Oakley, Cincinnati.—Radial and upright drills including 6-foot "Super-Service" radial with 19-inch column; 8-foot "Super-Service" radial with 11-inch column; 21-inch direct drive upright; "Super-Service" production drill.

CINCINNATI GRINDERS INC., Cincinnati.—Plain hydromatic miller; Duplex hydromatic miller; No. 3 universal miller; No. 3 plain miller; Cincinnati cutter grinder; Cincinnati No. 2 centerless valve tapper grinder; No. 2 centerless piston pin grinder; No. 4 centerless bearing race grinder; 14 x 48 plain cylindrical grinder.

CINCINNATI LATHE & TOOL CO., Oakley, Cincinnati.—16-inch x 6-foot Cincinnati geared head lathe for tool room work; 24-inch x 10-foot geared head lathe, motor drive, with square turret attachment for severe duty work.

CINCINNATI MILLING MACHINE CO., Cincinnati.—Plain hydromatic miller; Duplex hydromatic miller; No. 3 universal miller; No. 3 plain miller; Cincinnati cutter grinder; Cincinnati No. 2 centerless valve tappet grinder; No. 2 centerless piston pin grinder; No. 4 centerless bearing race grinder; 14 x 48 plain cylindrical grinder.

CINCINNATI SHAPER CO., Cincinnati.—16-inch heavy duty Cincinnati rapid traverse shaper equipped with universal table; 24-inch heavy duty Cincinnati rapid traverse shaper; Cincinnati gear burnisher; shaper parts and assembles.

CLEVELAND AUTOMATIC MACHINE CO., 2269 Ashland road, Cleveland.—½-inch model M five spindle bar machine with independent feed control for all tools; ⅞-inch model M four spindle multiple drilling, forming and cut-off machine, blanking four nuts simultaneously from the bar; 7-inch model M five spindle chucking machine for castings, forgings or stampings.

CLEVELAND HOBBING MACHINE CO., 1170 East 152nd street, Cleveland.—Eight spindle rotary hobbing machine.

CLEVELAND PLANER CO., 3148 Superior avenue, Cleveland.—Cleveland open side planers.

CLEVELAND TWIST DRILL CO., 1242 East Forty-ninth street, Cleveland.—Drills, reamers.

COCHRANE-BLY CO., Rochester, N. Y.—No. 66 metal sawing machine with hydraulic feed and air clamp; No. 55 metal sawing machine with air clamp and multiple cutting fixtures; No. 21 automatic high speed saw with power stock feed; No. 2 filing machine; No. 11 saw sharpening machine; No. 14 Duplex shapermiller.

COLONIAL TOOL CO., 8432 Butler avenue, Detroit.—Michigan Tool Co. milling cutters, hobs, gear-shaper cutters, special tools; Colonial Tool Co., round, spline, and combination round-and-spline broaches; spline gauges.

COLUMBIA MACHINE TOOL CO., Hamilton, O.—Columbia 24-inch superior heavy duty back geared crank shaper with speed box, friction clutch and brake and constant speed motor drive; vertical Chucking machine of complete new design.

CONRADSON TOOL CORP., 2116 Indiana avenue, Chicago.—Shell reamers; expansion reamers; arbors; milling cutters.

CONSOLIDATED MACHINE TOOL CORP. OF AMERICA, Rochester, N. Y.—Heavy duty boring mill; cold saw; milling machine; small tools for threading.

COVEL-HANCHETT CO., Big Rapids, Mich.—Two-spindle horizontal grinding machine; face grinding machine, 20-inch wheel; large size double-spindle machine with special fixtures; combination face grinding and locomotive guide bar grinder; vertical spindle machine; automatic surface grinder; Universal cutter and tool grinder; small size surface grinder; twist drill grinders; small size metal saw sharpening machine; large size metal saw sharpening machine.

CUSHMAN CHUCK CO., Hartford, Conn.—Collet chucks; dust-proof chucks; new pattern lathe chucks; boring mill jaws.

CUTLER-HAMMER INC., Milwaukee.—A. C. and D. C. automatic motor control; planer control; A. C. and D. C. manual motor control; Across-the-line "X" automatic starters; safety switches; push buttons; accessories.

DANLY MACHINE SPECIALTIES, INC., 2104 South Fifty-second street, Chicago.—Die makers' supplies; die sets; guide posts; guide bushings; dowel pins; automatic gages; die springs; shoulder screws; socket head cap and set screws.

DEVLIEG MACHINE TOOL CO., Jackson, Mich.—High-powered precision simplified production type milling machine.

DEWALT PRODUCTS CORP., Leola, (Lancaster Co.), Pa.—DeWalt Wonder metal worker for cutting steel tubing; DeWalt Wonder worker, a combination woodworker; DeWalt jointer; DeWalt mortiser.

DIAMOND MACHINE CO., 9 Codding street, Providence, R. I.—Diamond face grinding machine; type H surface grinding machine, Universal head; continuous grinding machine.

HENRY DISSTON & SONS, INC., Philadelphia.—Metal cutting saws, files and tool steel; a fast running cut-off machine in operation; band saw machine in operation; hack saw machine in operation.

DRESSES MACHINE TOOL CO., Cincinnati.—3-foot 11-inch column "Multi-duty" radial drill.

EASTERN MACHINE SCREW CORP., New Haven, Conn.—"H & G" self-opening die heads; high speed hob chasers; "H & G" threading machine, chaser grinder and feed pushers.

ECLIPSE COUNTERBORE CO., Detroit.—Counterbores; countersinks; core drills; multi diameter cutters and special production tools for automotive and airplane motor manufacturers; operating demonstration of production tools.

ECONOMY ENGINERING CO., 108 Vine street, Willoughby, O.—¾-inch Economy automatic shaving machine, type S; ¾-inch combined automatic pointing and threading machine; ¾-inch four-spindle semi-automatic threading machine.

ELWELL-PARKER ELECTRIC CO., 4205 St. Clair avenue, Cleveland.—Electric industrial trucks; electric tiering trucks; new "Swiss Model" electric lift trucks; portable electric cranes.

EX-CELL-O AIRCRAFT & TOOL CORP., 1200 Oakman boulevard, Detroit.—Tool steel drill jig bushings; internal grinding spindles; diesel fuel pump parts; tool detail parts; aircraft engine precision parts.

FAFNIR BEARING CO., New Britain, Conn.—Line of ball bearings.

FAIRBANKS, MORSE & CO., 900 South Wabash avenue, Chicago.—Sectionalized 25 horsepower squirrel-cage motor; sectionalized clean-air-jacket motor; clean-air-jacketed ball-bearing motor in operation; direct-current ball-bearing motor, a range of various sizes of ball-bearing motors.

FARRELL-BIRMINGHAM CO. INC., 344 Vulcan street, Buffalo.—No. 2-A Sykes gear generator; No. 1-A Sykes gear generator; one-tooth pinion stand; gear box of selective type with 40 degree angle Sykes herringbone gears constantly in mesh; range of Sykes gear tooth comparators.

FELLOWS GEAR SHAPER CO., Springfield, Vt.—Machines for cutting gears for four-speed transmission gear boxes, including No. 712 high-speed gear shapers for roughing and No. 77 side trimming high-speed gear shaper for finishing; No. 7A drop apron high-speed gear shaper; No. 7A standard high-speed gear shaper for cutting steel gear blanks having a 2-inch face; No. 75 high-speed gear shaper for cutting helical gears; a high-speed gear shaper with a kickoff and reversing attachment for cutting segment gears for a cash register; No. 612A gear shaper for cutting steel gear blanks of 5-inch face width; a thread generator in operation "Red Liner" automatic gear inspection machines; an involute testing machine for inspecting gear shaper cutters.

FLATHER CO., Nashua, N. H.—20-inch x 10-foot motor driven geared head engine lathe.

FOLEY MFG. CO., INC., 11 North East Main street, Minneapolis.—Foley automatic saw filers; automatic hack saw grniders; circular saw grinders; hand saw retoothers; automatic saw setting equipment.

FOOTE-BURT CO., 18000 St. Clair avenue, Cleveland.—No. 1 surface broaching machine; No. 15½-F six-spindle drilling machine; No. 16 hydraulic feed drilling machine; No. 15½-D drilling machine; No. 22½ high duty drilling machine; BW-23 two-spindle sensitive drilling machine; No. 1¼ two-spindle sensitive drilling machine; DE-1 single-spindle sensitive drilling machine; No. 4½ independent feed drilling machine.

FOSDICK MACHINE TOOL CO., Cincinnati.—No. 2 two spindle sensitive drill, 13-inch; No. 4 two spindle sensitive drill, 24-inch; No. 5 three spindle sensitive drill, 16-inch; 6-foot 19-inch column "Economax" radial drill.

FOSTER MACHINE CO., Elkhart, Ind.—No. 5 all geared head universal turret lathe; 1-F turret type "Fastermatic"; 3-F platen type "Fastermatic"; 3-F turret type "Fastermatic"; 4-F platen type "Fastermatic."

FREDERICKSON CO., Saginaw, Mich.—Spindle bearings; lead screw nuts; miscellaneous machine tool bearings and bushings of Sabeco bearing metal; worm gear castings.

FREW MACHINE CO., 124 West Venango street, Philadelphia.—No. 1 automatic tapper; No. 4 hand milling machine; No. O duplex drill; No. 2 automatic tapper.

GAIRING TOOL CO., Detroit.—Small tools; swing tool boring and facing heads; full floating holders; quick-change floating tap holders; multiple boring and facing cutters; multiple operation core drilling, counterboring and chamfering tools, inserted blade and solid type; Gairing nose drive reamers, inserted blade and solid; inserted blade hollow mills; inverted counterbores; standard counterbore sets for tool room machine shop use; chucking reamers; offset spot facing heads; grinding fixtures. Standard type A,B and C counterbores and core drills, multiple operation cutters, Gairing full floating holders and nose drive reamers in operation.

GALLMEYER & LIVINGSTON CO., Grand Rapids, Mich.—Grand Rapids hydraulic feed surface grinders, hand feed surface grinders, universal cutter and tool grinders, twist drill

grinders, tap grinders, combination twist drill and tap grinders.

GARDNER MACHINE CO., Beloit, Wis.—No. 9 40-inch super disk grinder in operation, grinding coils springs; No. 84 special automatic hexagon nut grinder in operation, grinding hex nuts; No. 86 30-inch horizontal grinder with hand operated swinging work table; No. 3-CB 'Speed-U-Need" polishing lathe; No. 3-DA double spindle "Speed-U-Need" polishing lathe.

GATERMAN MFG. CO., W., Manitowoc, Wis.—Pneumatic oscillating tapping machines.

GEARS & FORGINGS INC., 3010 Woodhill road, Cleveland.—Gears; forgings; reduction units; machine tool parts; transmissions.

GENERAL ELECTRIC CO., Schenectady, N. Y.—Motors and control applicable to machine tools.

GENERAL RADIAL DRILLING MACHINE CO., 1767 Elmore street, Cincinnati.—5-foot 15-inch column hydraulic radial drill; 3-foot 9-inch column sensitive radial drill.

GEOMETRIC TOOL CO., Blake & Valley streets, New Haven, Conn.—Self opening die heads; style D for hand machines; KH for hand machines; DS for Brown & Sharpe automatics; KD rotary heads for live spindles; special purpose tools; collapsing taps receding chaser taps; solid adjustable die heads; solid adjustable taps; threading machines; chaser grinder; chaser grinding fixture.

GIDDINGS & LEWIS MACHINE TOOL CO., Fond du Lac, Wis.—No. 50 extra heavy table type high pressure power precision horizontal boring, drilling and milling machine.

GISHOLT MACHINE CO., Madison, Wis.—Turret lathes; automatic chucking machines; balancing machines; tool grinder.

GITS BROS. MFG. CO., Chicago.—Oil cups; oil hole covers; sight feed lubricators; high pressure grease cups; multiple feed oilers; high pressure grease gun and fittings.

GLEASON WORKS, 1000 University avenue, Rochester, N. Y.—3-inch spiral bevel gear generator; 10-inch manufacturing spiral bevel gear generator; 15-inch spiral bevel gear generator; 60-inch spiral bevel and hypoid generator; 4-inch spiral bevel cutter sharpener; 12-inch spiral bevel cutter sharpener; cutter angle testing device; 3-inch straight bevel gear generator; universal manufacturing bevel gear generator; 12-inch straight bevel gear generator; generator tool grinder; four spindle manufacturing rougher; Multiple spindle rougher cutter sharpener; 18-inch combination testing and lapping machine.

GODDARD & GODDARD INC., Detroit.—Milling cutters, including special and standard classes in both form and profile type; demonstration of cutting in alloy steel.

GOSS & DE LEEUW MACHINE CO., New Britain, Conn.—6-inch and 11-inch G & DL tool revolving multiple spindle automatic chucking machine; No. 6 work revolving multiple spindle automatic chucking machine.

GOULD & EBERHARDT, Newark (Irvington) N. J.—No. 9H Universal manufacturing gear hobbing machine; 12HS manufacturing gear hobbing machine; 48HS manufacturing gear hobbing machine; 24-inch manufacturing shaper with universal table; 36-inch manufacturing shaper.

GREENFIELD TAP & DIE CORP., Greenfield, Mass.—No. 12 Greenfield high speed internal grinder; No. 1 hydraulic plain grinder; No. 3 motor-in-head cutter and reamer grinder; No. 734 threading machine with automatic opening die head; snap, plain and thread gages; "Acorn" and button dies; ground and cut thread taps; twist drills; screw slotting cutters; reamers; pipe tools.

GREENLEE BROS. & CO., Rockford, Ill.—Four spindle automatic screw machine; multiple spindle drilling machine.

GURNEY BALL BEARING DIVISION, MARLIN-ROCKWELL CORP., 402 Chandler street extension, Jamestown, N. J.—Radial, radio-thrust and thrust ball bearings; head stocks, a valve grinder, vertical electric motors and a reduction unit, all equipped with Gurney ball bearings.

HALL PLANETARY CO., Fox street and Abbotsford avenue, Philadelphia.—Type B planetary full automatic; type A planetary illustrating various types of threads and bores; type D planetary in production as internal milling; machinabilameter—a new instrument for testing the machineability of metals.

HAMMOND MFG. CO., 7808 Kinsman road, Cleveland.—Radial drilling and tapping machine; pedestal automatic tapping machine; cabinet base polishing and buffing machine; six spindle hydraulic drilling machine.

HANNA ENGINEERING WORKS, 1765 Elston avenue, Chicago.—Hanna "Rapid" riveter—capacity ¼-inch rivets cold; Hanna "Yoke" riveter—capacity ⅝-inch rivets cold; Hanna "Closed Yoke" riveter for automobile chassis frame riveting; Hanna "Turret" riveter for automobile chassis frame riveting.

HANNIFIN MFG. CO., 621 South Kolmar avenue, Chicago.—Air operated chucks; air operated arbor presses; air operated rivet presses; air operated work holding fixtures; air operated vises; air control valves; air pressure regulating valves; air operated expanding mandrels; air clutch countershafts; stationary double acting air cylinders; hydro-pneumatic broaching presses; boring bars; air operated devices.

HANSON-WHITNEY MACHINE CO., Hartford, Conn.—Universal semiautomatic thread milling machine; universal vertical tool and die shaping machine; rapid precision centering machine; taps, gages, hobs and screws, finished after hardening by the Hanson process.

HARDINGE BROS., INC., Chicago.—Bench lathes and attachments; bench millers; quick-change precision lathe.

HEALD MACHINE CO., 10 New Bond street, Worcester, Mass.—No. 72A-3 "Size-Matic" internal grinding machine; No. 72A-3 "Gage-Matic" internal grinding machine; No. 72A-5 airplane cylinder grinding machine; No. 25A rotary surface grinder with 30-inch chuck.

HENDEY MACHINE CO., Torrington, Conn. 12-inch x 5-foot high speed ball bearing lathe; 12-inch x 5-foot geared head lathe, taper attachment, oil pan, No. 3 drawing-in attachment; 18-inch x 10-foot geared head lathe, ball bearing spindle, taper attachment, sub headstock; 16-inch heavy duty crank shaper; 32-inch heavy duty crank shaper; No. 12 hydraulic broaching machine.

HENRY & WRIGHT MFG. CO., 760 Windsor street, Hartford, Conn.—Henry & Wright dieing machines (high speed automatic punch presses); multiple station progressive dies; high speed multiple-spindle sensitive drilling machines.

HIGLEY MACHINE CO., South Norwalk, Conn.—Higley 8-inch capacity "Coldcut" sawing machine equipped with screw feed table for feeding heavy bars up to cutting position and swivel type front table with gage stop to handle pieces being cut off and to gage length of pieces.

HILL-CURTIS CO., Kalamazoo, Mich.—Electric grinders, bench and pedestal type; belted grinders, bench and pedestal type; electrically driven railroad journal wedge reclaimer; selective speed tool and productive grinders, electric; "Rite Speed" electric polishing lathes; belted polishing lathe; disk grinders, electric.

HISEY-WOLF MACHINE CO., Cincinnati.—Electric drills, grinders, buffers.

HOEFER MFG. CO., Freeport, Ill.—5-7½ horsepower production drillers; auxiliary heads.

HOUGHTON & CO., E. F., Philadelphia—Microstructure of steels after Society of Automotive Engineers' recommended heat treatment; "Houghtoclean" for metal cleaning; "Hocut" for metal cutting; Vim leather belting and leather packings; lubricating oils.

HYATT ROLLER BEARING CO., P. O. Box 476, Newark, N. J.—Hyatt bearings for machine tool application; photographic illustration of bearing applications to machine tools ranging from board drop hammers to finishing tools of every kind.

HYDRAULIC PRESS MFG. CO., 20 East Broad street, Columbus, O.—H-P-M hydro-power press; H-P-M hi-speed hydraulic shop press.

ILLINOIS TOOL WORKS, 2501 North Keeler avenue, Chicago.—Milling cutters; hobs; reamers; broaches; ground form tools; die filing machines; tool testing fixtures; Wedgelock tool holders.

INGERSOLL MILLING MACHINE CO., Rock-

(*Continued on Page 720*)

Plan Meetings During Week of Show

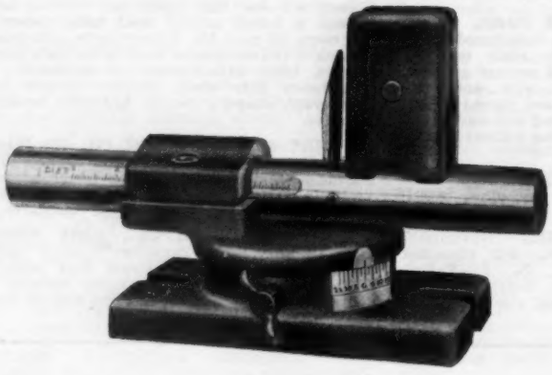
ARRANGEMENTS have been made for technical and other programs to be held in conjunction with the machine tool show. Organizations which will participate are the machine shop practice division of the American Society of Mechanical Engineers, the production committee of the Society of Automotive Engineers, and the Machine Tool congress. All sessions will be held at Hotel Cleveland.

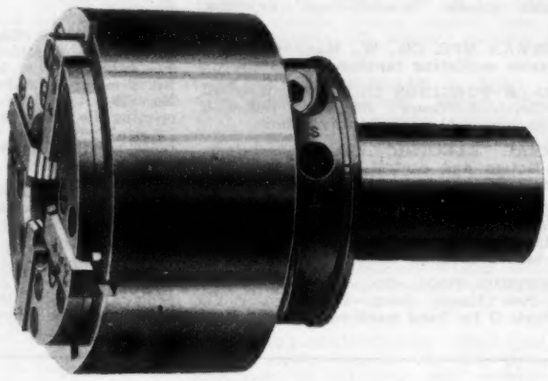
The first named will hold sessions on Monday and Tuesday evenings, Sept. 30 and Oct. 1. George T. Trundle, president, Trundle Engineering Co., Cleveland, will speak Monday evening on "What Information Does the Machine Tool Buyer Need from the Machine Tool Salesman?" Dr. Zay Jeffries, consulting engineer, General Electric Co., Cleveland, will present an address, Tuesday evening, on "The Present Status of Cemented Tungsten-Carbide Tools and Dies."

The sessions on Wednesday and Thursday evenings, Oct. 2 and 3, will be under the auspices of the Society of Automotive Engineers. On Wednesday evening Prof. F. E. Raymond, Massachusetts Institute of Technology, Boston, will speak on "Economic Production Quantities"; and on Thursday evening there will be a production forum composed of a general symposium on four important topics in the automotive field, with general discussion under each subject. These topics are: "The Application of Standard Machine Tools to Automobile Manufacture"; "Results in Production Due to New Features in Machine Tool Construction;" "Synchronizing Automobile Parts at the Assembling End" and "The Basis of Replacing Machine Equipment."

On Friday evening a dinner will be held at Hotel Cleveland.

New Attachments and Equipment





New Grinding Fixture, Dies and Taps

AMONG the products of new design to be seen at the exposition are taps, dies and a universal chaser grinder fixture exhibited by the Geometric Tool Co., New Haven, Conn.

The chaser grinder fixture, illustrated above at the left, is designed for grinding chasers on both the cutting face and chamfer. Milled chasers, tapped or hobbed die head chasers, collapsing tap chasers, etc., may be reground with equal facility on this fixture even though this means a flat chamfer, a concave chamfer and a convex chamfer, respectively. The cutting face of these different types may also be reground on the same fixture, giving the required angle of hook or snub.

The solid adjustable die head, pictured at the right above, has a size-adjustment mechanism which permits adjustment without removing the tool from its spindle or holder, yet is locked so securely that the die head will not change its size when suddenly reversed at high speeds.

One of the features of the adjustable tap (center above) is that all working parts, even the size-adjustment mechanism, are located in the nose or front end of the tool. The tap is compact so that it will swing in small space, and therefore can be used to special advantage on chucking machines and for sizing either by machine or by hand.

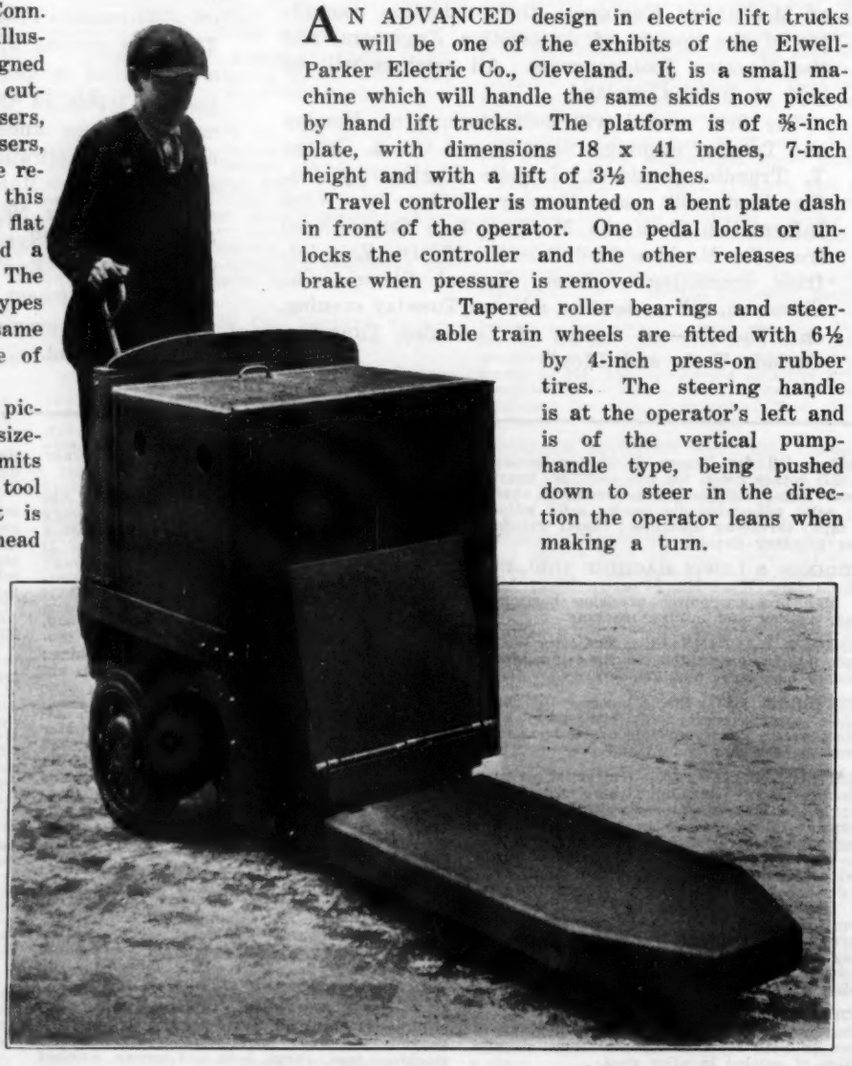
The receding chaser tap, shown on the opposite page, is designed for tapping taper threads where the depth is great, the taper is steep and the material is tough.

Will Show Electric Lift Truck

AN ADVANCED design in electric lift trucks will be one of the exhibits of the Elwell-Parker Electric Co., Cleveland. It is a small machine which will handle the same skids now picked by hand lift trucks. The platform is of ⅜-inch plate, with dimensions 18 x 41 inches, 7-inch height and with a lift of 3½ inches.

Travel controller is mounted on a bent plate dash in front of the operator. One pedal locks or unlocks the controller and the other releases the brake when pressure is removed.

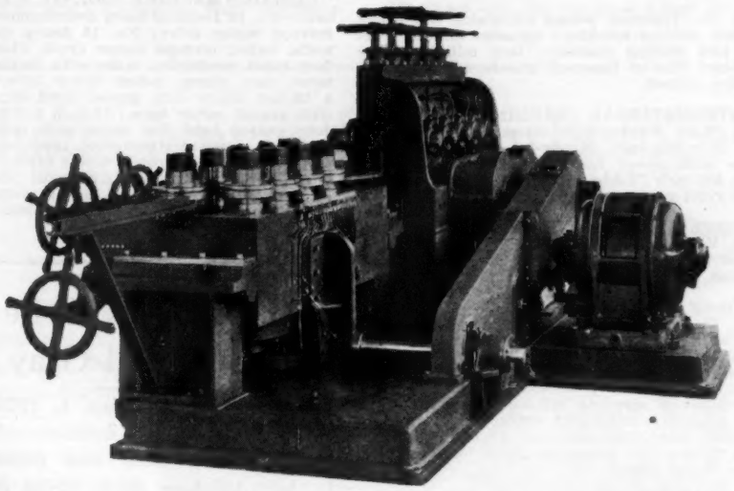
Tapered roller bearings and steerable train wheels are fitted with 6½ by 4-inch press-on rubber tires. The steering handle is at the operator's left and is of the vertical pump-handle type, being pushed down to steer in the direction the operator leans when making a turn.

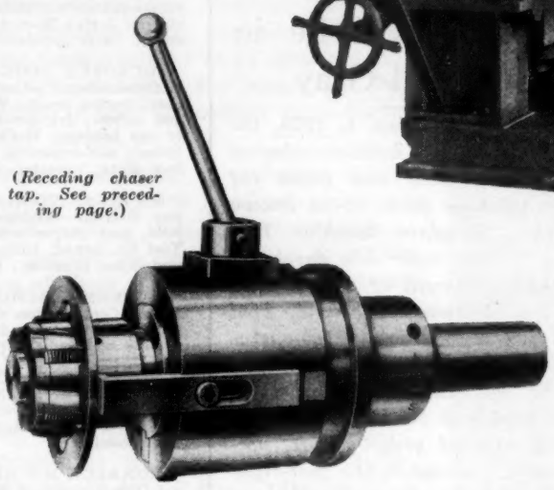


To Aid Production in Industry

Will Illustrate Roll Straighteners

AMONG the several roll straighteners developed by Kane & Roach, Inc., Syracuse, N. Y., is the combination vertical and horizontal shaft machine shown at the upper right on this page. This straightener is designed for use where the combination of roll shafts results in a higher percentage of material being straightened within the limits required, in one pass through the rolls. Roll shafts are of chrome manganese steel, accurately ground and machined. Gears are of machined forgings, heat-treated when necessary. Reduction and drive gears run in oil-tight boxes. One of the features of this line of machines is the Alemite lubricating system, which is clearly shown in the illustration. The machines have a delivery speed of from 60 to 300 feet per minute and will handle rounds, flats, squares, angles, special shapes, rails, window casings, etc.





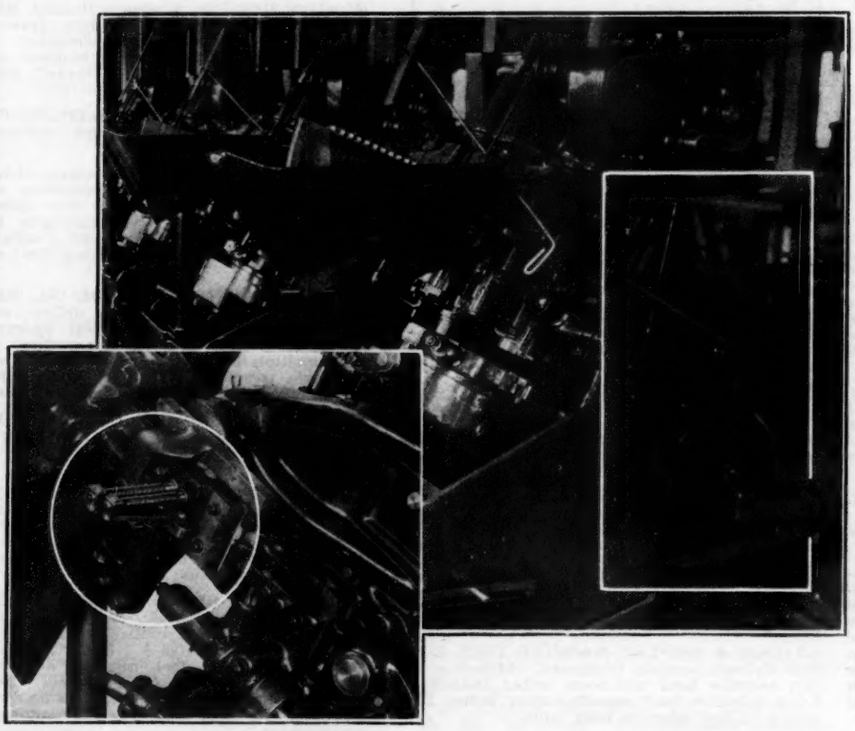
(Receding chaser tap. See preceding page.)

Two New Attachments for Threading Machines

TWO new attachments have been incorporated in automatic forming and threading machines manufactured by the Landis Machine Co., Waynesboro., Pa. One, shown within the circle in the inset at the left of the accompanying illustration is known as an escapement attachment, intended to be used in connection with the production of long hexagon and square head bolts, and bolts and screws having odd shaped heads such as rim, plow and step bolts. The escapement attachment is built in the magazine and releases one bolt at a time at the end of the magazine, thus relieving the bolt to be transferred to the chuck turret, of the weight of bolts in the magazine and preventing interference of bolt heads. This attachment covers the range of machines from 5/16 to ¾-inch diameter and 1 to 6-inch length.

The other attachment, shown in the rectangle at the right of the illustration, is a rear delivery conveyor to deliver the bolts to the handling boxes. The conveyor has an oscillating motion to move the bolts slowly toward the handling boxes, allowing most of the coolant to drain off. The coolant is collected in the trough under the conveyor and returns to the pump in the bed. Small chips also are separated from the bolts, the chips dropping through perforations in the conveyor.

The conveyor, although illustrated as a rear delivery type, can be arranged to deliver the bolts at the front of the machines.



Directory of Exhibitors and Exhibits

(*Continued from Page 717*)

ford, Ill.—Ingersoll 4-head adjustable rail heavy pattern milling machine; openside milling, boring and drilling machine; face milling cutter grinder; line of Ingersoll standard and special milling cutters.

INTERNATIONAL MACHINE TOOL CO., 1124 West Twenty-first street, Indianapolis.—1-H 24 x 5¼-inch "Libby-International" turret lathe with power feed cross slide turret; 3-H 29 x 8¼-inch "Libby-International" turret lathe with rigid turret.

JONES & LAMSON MACHINE CO., Springfield, Vt.—Hartness automatic dies and chasers, screw thread comparator, Hartometer; Flanders ground thread taps; chaser grinder.

JONES & LAMSON MACHINE CO., Springfield, Vt.—2¼ x 24 Hartness flat turret lathe for bar work; 3 x 36 Hartness flat turret lathe for chucking work; 14-inch standard Fay automatic lathe for second operation on clutch gear; 14-inch standard Fay automatic lathe for finning operation on airplane cylinders; 14 x 50-inch Fay automatic lathe with center drive tooled to machine large truck rear axle in one operation; 24 x 42-inch Fay automatic lathes for machining large flange shaft.

KANE & ROACH INC., Syracuse, N. Y.—Literature and motion picture display of Kane & Roach equipment.

KEARNEY & TRECKER CORP., Milwaukee.—No. 2 Standard universal Milwaukee milling machine; No. 2 rotary vertical Milwaukee milling machine with Skip-Stop rotary table; No. 1402 "Mil-waukee-Mill" Simplex; No. 2207 Bridge-Type "Mil-waukee-Mill."

KELLER MECHANICAL ENGINEERING CORP., 70 Washington street, Brooklyn, N. Y.—Type BL-2416 Keller full automatic tool room machine equipped with two-template rigging and attachment for locating and jig boring; No. R6 cutter and radius grinder; a "Kellocater" complete unit with over-arm and spindle equipped with power feed; "Kellerflex" flexible shaft machines including a 1-horsepower outfit.

KELLY REAMER CO., Box 432, Cleveland—Boring and reaming tools, including special production tools for boring and reaming and multiple cutting; turret lathe; drill press; horizontal boring mill; vertical turret lathe equipment for all types of work, particularly for cylinder, crankcase and multiple cutting operations; (all tools adjustable and interchangeable.)

KEMPSMITH MFG. CO., Milwaukee.—Milling machines.

KENT MACHINE CO., Cuyahoga Falls, O.—Six spindle horizontal driller; double head countersinker; bar pointer; stud threader.

KEYSTONE LUBRICATING CO., Twenty-first and Clearfield streets, Philadelphia—Keystone safety lubricators; Pneuma-Lectric lubricating system; grease cups; greases (solid, semi-solid cup greases, liquid greases for ring oil bearings.)

KING MACHINE TOOL CO., Cincinnati.—Heavy duty vertical boring and turning mills.

KINGSBURY MACHINE TOOL CORP., Keene, N. H.—Automatic multispindle indexing machine for drilling, reaming and tapping with pneumatic synchronization of spindle stroke and index; automatic two spindle vertical drilling and burring machine; automatic three spindle dial feed tapping machine; type EC opposed spindle drilling and tapping machine; model 30 drilling head; model 30 T. tapping head.

KNIGHT MACHINERY CO., W. B., St. Louis, Mo.—No. 4 and No. 2 Knight millers; set of dial indicators mounted on No. 4 miller for jig boring; high speed, horizontal, shaping, circular milling and index attachments for use on either No. 4 or 2 millers.

WILLIAM LAIDLAW INC., Belmont, N. Y.—Type CM 30-inch metal cutting band saw; type JM 20-inch metal cutting band saw; type SW 20-inch metal cutting band saw.

LANDIS MACHINE CO., Waynesboro, Pa.—¾-inch Landis automatic forming and threading machine; 6-inch Landis pipe threading and cutting-off machine, motor driven; Lanco heads for automatic, semiautomatic and hand operated threading machines; Landmatic heads for turret lathes and hand operated screw machines; Victor collapsible taps for internal threading; Victor receding chaser collapsible taps for internal threading; Victor adjustable taps.

LANDIS TOOL CO., Waynesboro, Pa.—Hydraulic cam grinder; hydraulic oscillating grinder; plain hydraulic grinder; hydraulic crank grinder.

LA SALLE TOOL CO., Ottawa, Ill.—No. 824 full electric automatic surface grinder; No. 3 electric surface grinder; No. 1 electric plain and surface grinder.

LEBLOND MACHINE TOOL CO., R.K., Cincinnati.—No. 12 LeBlond heavy duty automatic lathe, texrope motor drive; No. 16 heavy duty automatic lathe; texrope motor drive, 11-inch x 4-foot rapid production lathe with facing attachment, pan, pump, belted motor drive; 25-inch x 12-foot heavy duty geared head engine lathe with geared motor drive; 15-inch x 8-foot heavy duty geared head tool room with relieving attachment, draw-in attachment, taper attachment, pan, pump and "Texrope" motor drive; 16-inch x 5-foot rapid production lathe with plain rests, rapid power traverse, pan, pump, belted motor drive; No. 1 cutter grinder complete with all attachments, with power feed to table, and completely motor driven.

Machines Will Be in Standard Gray

EFFECTIVE Aug. 1, 1929, the machine tool builders adopted a standard color and finish for their machine tools, to be known as the "Standard Machine Tool Gray." This color was developed through the work of a committee of the National Machine Tool Builders' association, in co-operation with the paint manufacturers.

The machine tools shown at Cleveland will be finished in this newly adopted gray—a soft, not-too-dark, not-too-light, just-right shade, that is pleasing and practical.

This means that visitors at this show, for the first time in history, will find an array of equipment all finished in the same color and degree of gloss. More than ever the exposition hall will resemble a large machine shop, with all elements in harmony, keyed to production.

LEES-BRADNER CO., Cleveland.—Thread millers and gear cutters.

LEHMANN MACHINE CO., 3560 Chouteau avenue St. Louis.—Geared head, motor driven engine lathe; gear lapping machine.

LELAND-GIFFORD CO., Worcester, Mass.—12-inch one spindle belt and motor spindle sensitive drill; 14-inch two spindle belt and motor spindle sensitive drill; 24-inch two spindle belted spindle drill.

LINCOLN ELECTRIC CO., Coit road and Kirby avenue, Cleveland.—Electronic tornado automatic welder in action; Stable arc welder in action; "Linc-Weld" motors and welder supplies, samples, etc.

LINK-BELT CO., Indianapolis.—Link-Belt silent, roller and malleable chains and sprocket wheels; automatic idler for use with Link-Belt silent chain drives applied to main and integral shaft of machine tools; Link-Belt paradox showing detailed action of silent chain on wheels; herringbone speed reducer in operation showing complete antifriction reducer and full herringbone gears.

LODGE & SHIPLEY MACHINE TOOL CO., 3065 Colerain avenue, Cincinnati.—14-inch x 6-foot selective head tool room lathe; 18-inch x 8-foot selective head manufacturing lathe; 24-inch x 12-foot selective head lathe.

LOGANSPORT MACHINE CO., Logansport, Ind.—Air operated work holding devices, including air operated chucks; chucking devices; rotating and nonrotating cylinders; arbor presses; milling and drilling vises; control valves.

LUCAS MACHINE TOOL CO., 523 East Ninety-ninth street, Cleveland—No. 42 "Precision" horizontal boring, drilling and milling machine; No. 41 "Precision" horizontal boring, drilling and milling machine with dial indicator indexing device; 30-ton Lucas power forcing press.

LUDLUM STEEL CO., Watervliet, N. Y.—Steel and tungsten carbide; mill and fabricated forms; Enduro Nirosta steel; Nitralloy; tool steels; forgings; Strauss metal.

MADISON-KIPP CORP., Madison, Wis.—Fresh oil systems automatic centralized lubrication devices; automatic die casting machine films.

MANNING, MAXWELL & MOORE INC., Putnam Machine Works, Fitchburg, Mass.—Putnam 72-inch rotary continuous milling machine and 36-inch type "K" rotary slitting machine.

MARSCHKE MFG. CO., Indianapolis.—Universal portable electric tools; high cycle portable electric tools; Marschke grinders and Marschke swing frame grinders.

McCROSKY TOOL CORP., Meadville, Pa.—McCrosky-Super adjustable reamers and reaming bars; boring heads; Wizard quick-change chucks and collets; friction-drive tapping collets; safety tap holders; McCrosky turret tool posts for lathes; self-centering steady-rests; "Neva-Stop" face plate; tungsten-carbide turning tools.

MICHIGAN TOOL CO., 147 Jos. Campau avenue, Detroit.—Michigan Tool Co. milling cutters, hobs, gear shaper cutters, special tools; Colonial Tool Co. round, spline, and combination round-and-spline broaches; spline gages.

MODERN MACHINE TOOL CO., Jackson, Mich.—Combination drill table and vise as applied to standard drill presses, electric drill presses and radial drills.

MOLINE TOOL CO., 102 Twentieth street, Moline, Ill.—No. 115-D hydraulic feed driller equipped with twelve standard BV Type heads; No. 114-U driller equipped with twelve universal joint heads.

MONARCH MACHINE TOOL CO., Sidney, O.—1 16-inch x 6-foot Monarch model "AA" heavy duty helical geared Timkenized high speed lathe; 1 16 x 30-inch model "C" sixteen speed helical geared completely Timkenized tool room lathe with full equipment; 1 24-inch x 10-foot model "N" sixteen speed extra heavy duty helical geared Timkenized lathe; hydraulic automatic lathe.

MORSE CHAIN CO., Ithaca, N. Y.—Morse silent chain drive; flexible couplings; speed reducer; device showing action of rocker joint; methods of lubrication.

MORTON MFG. CO., Muskegon Heights, Mich.—Morton 48-inch stroke high duty draw-cut shaper with variable speed transmission; 18-inch stationary keyway cutter with direct connected reversing drive unit; "Hi-pro" keys; Robinson air hose couplings.

MURCHEY MACHINE & TOOL CO., 951 Porter street, Detroit.—Collapsible taps; self-opening die heads.

NATIONAL ACME CO., Cleveland.—4-inch Gridley automatic four spindle chucking machine; 1¼-inch Gridley automatic four spindle bar machine; 9/16-inch Acme automatic five spindle bar machine; centrifugal oil clarifying and separating machine; self-opening dies; collapsing taps.

NATIONAL AUTOMATIC TOOL CO., Richmond, Ind.—Multiple spindle way driller; multiple spindle way tapper; vertical hydraulic single spindle heavy duty driller; vertical hydraulic multiple adjustable spindle driller; vertical single spindle Hi-duty gear feed driller; small multiple spindle driller; universal joints.

NATIONAL MACHINERY CO., Tiffin, O.—National 1½-inch high duty heading and forging machine; ⅛-inch automatic nut tapper; ⅞-inch automatic nut tapper.

NATIONAL TWIST DRILL & TOOL CO., Detroit.—Interlocking slab milling cutters, heavy duty parabolic type; staggered tooth side milling cutters; inserted blade high duty face milling cutters; twist drills; reamers; milling cutters; hobs; special tools; taps; dies; screw plates.

NEW BRITAIN-GRIDLEY MACHINE CO., New Britain, Conn.—No. 38 New Britain single-spindle, hydraulically operated work rotating chucking machine; No. 23-A New Britain four-spindle air operated tool rotating automatic chucking machine; No. 454 4-spindle "New-Matic" work rotating automatic chucking machine; No. 506 6-spindle 1¾-inch automatic screw machine.

NEW DEPARTURE MFG. CO., Bristol, Conn.

—New Departure bearing equipped spindle for vertical multiple spindle automatic; ball bearing equipped spindle and cylinder for large six spindle automatic; ball bearing equipped small high-speed internal grinder spindle; bearing equipped tailstock live centers of various sizes; various types of ball bearings used in machine tools.

NIAGARA MACHINE & TOOL WORKS, 697 Northland avenue, Buffalo.—Niagara No. 68-B double crank power press, geared, four piece tie rod frame; No. 56 straight side single crank press, geared, four piece tie rod frame; No. 696 power gap squaring shear; No. 4½ inclinable power press, plain, flywheel type; new type No. 340 slip roll former; No. 172 electric combination machine with interchangeable rolls for beading, crimping, turning, wiring, burring, edging and slitting.

NILES TOOL WORKS CO., Hamilton, O.—36 and 44-inch side head boring mill; 27-inch "Time Saver" lathe; 62-inch boring and turning mill.

NOBLE & WESTBROOK MFG. CO., 20 Westbrook street, East Hartford, Conn.—Power and hand operated marking machine for general purposes; rapid production single purpose marking machines; steel marking dies; steel stamps; automatic numbering heads for marking on metal.

NORMA-HOFFMANN BEARINGS CORP., Stamford, Conn.—Ball, roller and thrust bearings; machine tools of the smaller sizes with sectioned bearing mountings; photographs of machine tool applications; Norma minimeter (a precision measuring instrument); Hoffmann bearing pedestals.

NORTON CO., Worcester, Mass.—Crankpin grinding machine; hydraulic drive; crankshaft bearing grinding machine, hydraulic drive; plain cylindrical grinding machine, hydraulic drive; 10 x 48-inch size; open side surface grinding machine, hydraulic drive, 6 x 10 x 48-inch size; type A cylindrical grinding machine equipped with hydraulic wheel slide movement; type No. 50 crankshaft lapping machine; type No. 15-C cylindrical lapping machine.

OAKITE PRODUCTS INC., 22 Thames street, New York.—Literature and data pertaining to the cleaning of metals, cutting, grinding, rust prevention, and stripping finishes, and describing cleaning in industry generally.

OSTERLEIN MACHINE CO., Cincinnati.—No. 36 "Milomatic" (an automatic hydraulic reciprocating and indexing bed type milling machine); 28-inch tilted offset miller; 48-inch tilted offset miller; No. 2 Universal standard miller; No. 2 grinder; (all motor driven).

OHIO MACHINE TOOL CO., Kenton, O.—36-inch Super-Dreadnaught shaper; 24-inch dreadnaught shaper; Swift No. 35 flue welder; No. 6 combination copper and steel welder; No. 12 automatic welder; No. 16 projection welder.

OILGEAR CO., 647-683 Park street, Milwaukee.—Oilgear 25-ton Gooseneck type straightening press; twin-12 horizontal broaching machine; automatic variable delivery machine tool feed equipment.

O. K. TOOL CO. INC., Shelton, Conn.—O. K. metal cutting tools, lathe planer, boring mill and boring tools and holders; including inserted blade milling cutters; boring and facing heads, hollow mills and multiple operation tools; operating No. 5 Cinci-Hydromatic milling machine with O. K. milling cutters.

OLIVER INSTRUMENT CO., Adrian, Mich.—No. 51 Oliver drill grinder; "Arc" face mill grinder No. 2; drill point thinner; tap grinder; No. 21 drill grinder; S-4 die making machine; heavy duty die making machine.

OSTER MFG. CO., 2057 East Sixty-first

(*Continued on Page* 724)

To Exhibit Products Never Shown Before

THREE of the most recently developed products to be exhibited are a new gear machine, a comparator and a new gear just completed by the Farrel-Birmingham Co., Buffalo. The gear generator is for straight tooth, helical tooth the Sykes herringbone tooth gears up to 12 inch diameter and 5-inch face. This machine has many new features, one of which is that it operates at a higher speed than earlier models.

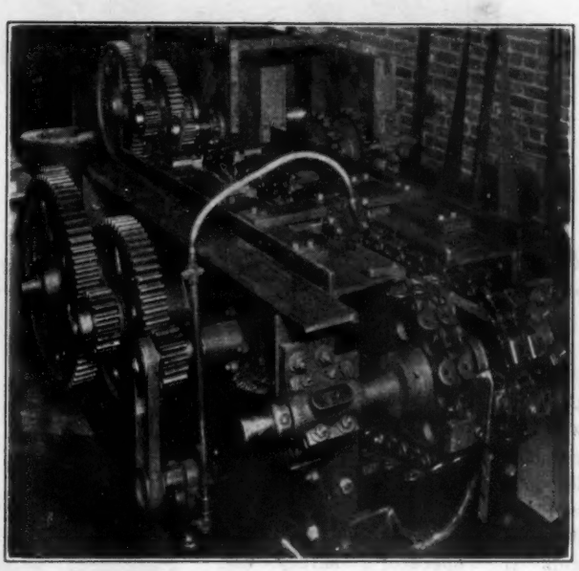
The second new product is a 40-degree helical angle Sykes herringbone gear in small sizes adapted to automobiles and machine tools. The third item is a gear tooth comparator to detect errors to within .0001-inch. None of these products have been shown publicly before.

Radial Drill Has New Features

A NEW 11-inch column radial drill will be introduced at the show by the Cincinnati Bickford Tool Co., Cincinnati. It is built with 3 or 4-foot arm and with 24 speeds in the head, ranging from 29 to 1850 revolutions per minute. To resist stresses, the arm is of full box section and has no openings. All speed and feed changes are made by selective sliding gears. Lubrication is designed so that the machine operates a long time without oiling. The drive, from motor through to spindle nose, is mounted on ball and roller bearings. A rapid hand traverse for the head has been developed which makes a power traverse attachment unnecessary. The head is supported by an adjustable roller bearing gib, a patented feature which permits easy movement of the head. A single, constant-speed motor is all that is required for this machine.

To Show Chain for Broach

AMONG the products to be exhibited by the Link-Belt Co., Chicago, are roller chain and sprockets of the type used in the semiautomatic broaching machine developed by the Amalgamated Metal & Machine Co., Cleveland, which is shown in the accompanying illustration. The machine consists of two endless matched horizontal steel roller chains between which are mounted broaching attachments, supported and traveling in steel ways. Under each attachment a half nut is mounted which engages a worm just

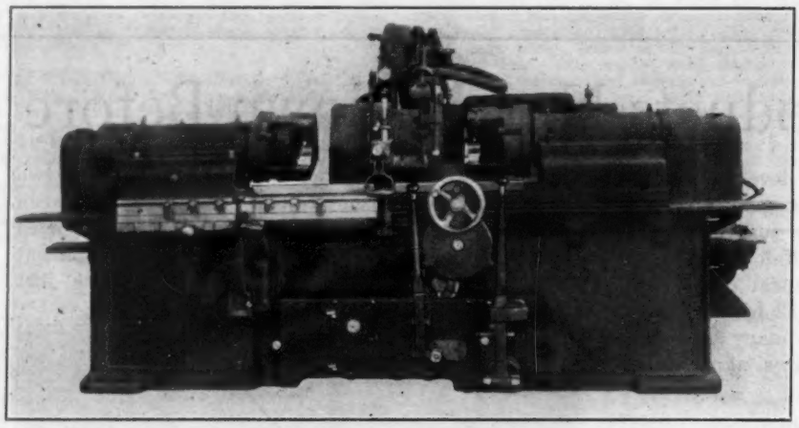


beyond a movable face plate. A cam raises the face-plate on the approach of the attachments. When the attachment clears, the face-plate immediately falls, holding the work while the broaches pull through.

Will Demonstrate Cutting Tools

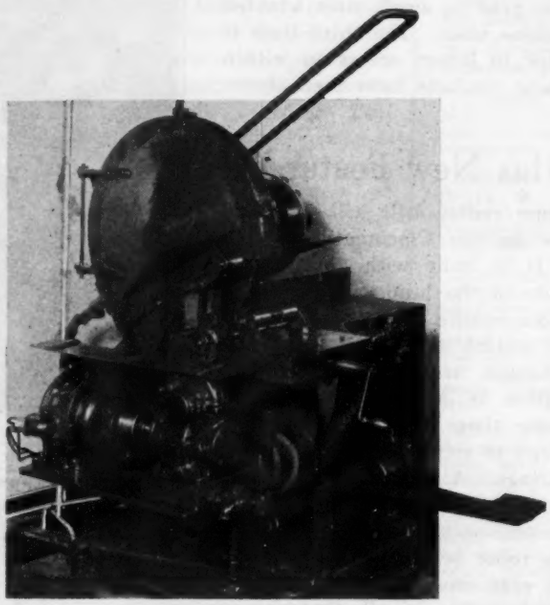
HAYSTELLITE, a cast-tungsten-carbide cutting alloy developed by the Haynes Stellite Co., Kokomo, Ind., will be used for machining cast iron and semisteel in the show rooms of Strong, Carlisle & Hammond, 1392 West Third street (Frankfort street entrance) Cleveland, during the week of the machine tool show. The demonstration will be made on a special lathe built by the American Tool Works, Cincinnati.

Will Show Machines in Operation



Crankpin Grinder

AMONG the five grinding machines being displayed by the Norton Co., Worcester, Mass., is a new crankpin grinding machine, shown in the illustration above. Hydraulic controls are provided on the work holders, table and wheel slide traverse, being made independent by means of a special interlocking device. No control can be operated while any other one is moving, a feature which aids the operator's safety and tends to eliminate spoiled work. Mechanical operation of the steadyrest is said to speed up and facilitate operation. Workholder spindles are synchronized and driven by two silent chains controlled by idler sprockets. The right hand work head is stationary and the left is provided with a lateral adjustment to permit maintenance of the proper alignment of the crankshaft. The machine is entirely self-contained, a single motor mounted on the side of the rear base furnishing motive power. It has a wing spread of 17 inches in diameter and is made in range of six sizes.

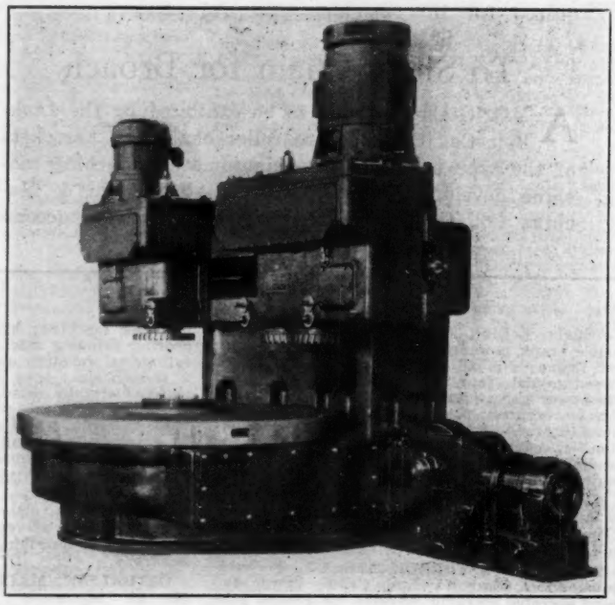


Rotating Attachment on Friction Saw

INCLUDED in a group of machines constituting the exhibit of Joseph T. Ryerson & Son Inc., Chicago, is a new friction saw with a special rotating attachment, the entire unit being shown in the center illustration. The attachment consists of a special work table on which are mounted supporting rollers for holding the stock in position while being cut. One set of rollers is driven by direct gearing from a fractional horsepower motor, through suitable speed reduction A second set of rolls is mounted on an adjustable bracket for various sizes of stock. A third roller is forced down on the stock by an air cylinder arrangement, holding the stock in position while it is being rotated. This attachment provides rotation of constant peripheral velocity to any size of round stock which may be placed in the machine.

Operates Machine for Production Milling

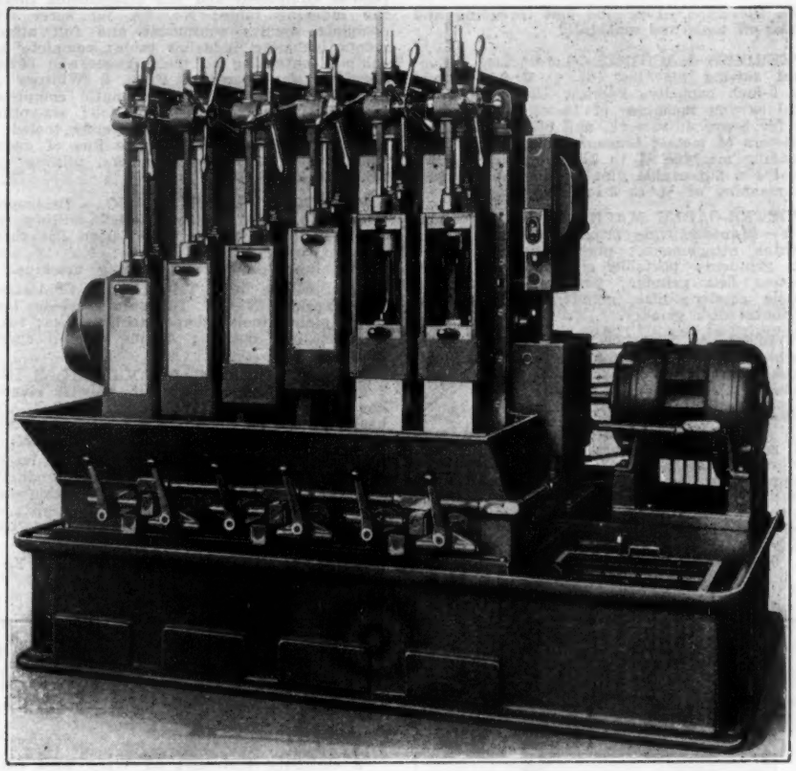
THE Putnam 72-inch rotary continuous milling machine, shown in the lower illustration, will be one of two machines operated at the booth of Manning, Maxwell & Moore Inc., New York. The miller, designed for production milling where large numbers of duplicate parts are to be machined, is an application of a Putnam unit milling head to a rotary miller. A two-spindle head for roughing and a single-spindle head for finishing are provided, both mounted on a rail and arranged to the rotary table that the horizontal distance from the spindles to the center of the table may be varied. Each head is equipped with a constant speed motor, giving a single spindle speed which may be varied by change gears.



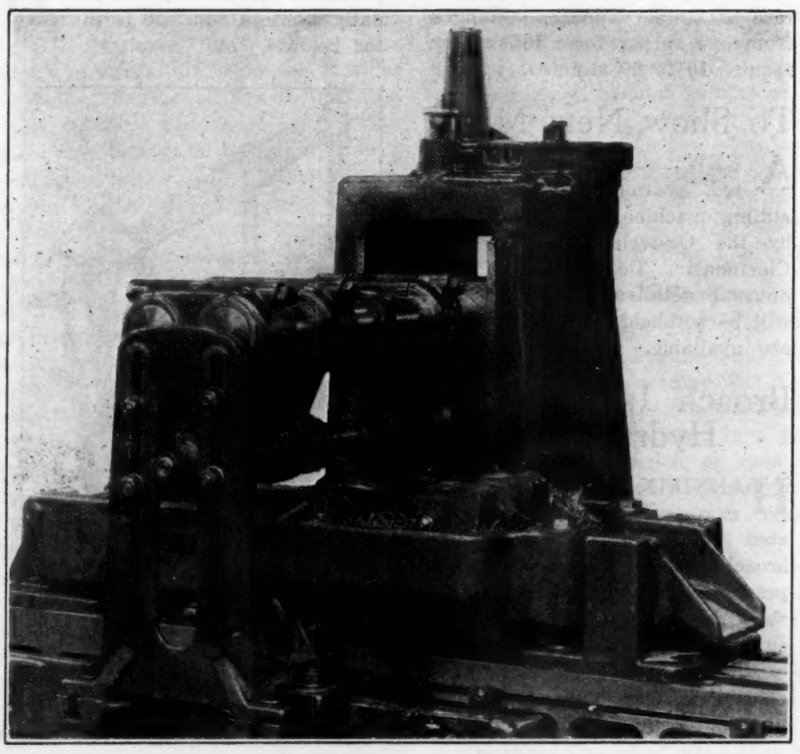
On Auto and Aeronautical Work

New Six-Spindle Deep Hole Driller

A SIX-spindle vertical deep hole driller, an illustration of which appears at the right, will be included in the display of Pratt & Whitney Co., Hartford, Conn. It is a high-production machine using the rifle barrel method of drilling. A rigid column is mounted on a cast-iron bed containing the oil reservoirs. The column carries the six work spindles and their slides together with the individual drive mechanisms. The six drills remain stationary and are mounted vertically on the bed beneath the spindles. On the rear of the bed is the pump drive compartment containing six high-pressure oil pumps, one for each drill, and a large motor which drives the pumps through suitable gearing. The slides which carry the work fixtures are counterweighted and are scraped to ways on the front of the column. The spindles rotate the work in the fixtures at the proper drilling speed. By this arrangement the six slides feed down independently under power and carry the rotating work to the stationary drills.



The drill is of special design and consists of a hollow shank to which is brazed a short, high-speed steel drill tip. The shank is made as long as required with a groove pressed into one side so that oil can be forced through the inside to the drill tip under high pressure and returned outside through the groove.



Milling Machines for Airplane Motor Work

APPLICATION of milling machines to the airplane engine industry will comprise the entire exhibit of Kearney & Trecker Corp., Milwaukee. Four milling machines will be shown in operation, one of which is shown in the lower illustration. It is a standard horizontal milling machine with a rise and fall fixture, milling the contour of master rods for a Curtiss engine. A milling machine for machining crankcases; a standard milling machine, vertical type with a rotary table for milling around ends of articulator rods; and a horizontal machine for milling small connecting rods, are the three other machines in the exhibit.

Several airplane engines will be on display, including one nine-cylinder whirlwind-type which has been cut away and sectioned.

Directory of Exhibitors and Exhibits

(*Continued from Page* 721)

place, Cleveland.—Pipe and bolt threading and cutting-off tools and machines.

PEERLESS MACHINE CO., Racine, Wis.—Metal sawing machines of 6 x 6-inch and 9 x 9-inch capacity, Peerless Universal type; metal sawing machines of 14 x 16-inch capacity for heavy duty work, and billets and large diameters of metal; Chicago No. 2 power pipe threading machine ¼ to 2-inch capacity; Universal No. 2 portable pipe cutting and threading machine of ⅛ to 2-inch capacity.

PORTER-CABLE MACHINE CO., Syracuse, N. Y.—Manufacturing lathe; Universal milling machine attachments; portable electric hand belt grinders; portable electric hand saws; two-way belt grinder; flexible belt grinder; spindle sander; disk grinders and sanders; horizontal disk grinder.

POTTER & JOHNSTON MACHINE CO., Pawtucket, R. I.—Automatic chucking machines; automatic chucking or turning machine.

PRATT & WHITNEY CO., Hartford, Conn.—13 x 30-inch model B lathe equipped with full relieving attachments, speed reducer, collets, chucks, etc., 16 x 36-inch model B lathe equipped for turning demonstrations of all sorts; 20 x 48-inch model B lathe equipped for turning demonstrations of all sorts; bench machine tool equipment including a P & W bench lathe, No. 3 Universal bench miller, No. 0 Sigourney drill arranged on a bench with complete countershafting and full attachments; 14-inch vertical surface grinder with complete standard equipment including magnetic chucks; 6-inch vertical shaper, model B with complete standard equipment and all attachments; 12-inch vertical shaper, model B with complete standard equipment and all attachments; No. 1A jig borer with complete regular equipment and full attachments including indexing table; No. 3A jig borer with complete regular equipment and full attachments including indexing table; complete tool cabinet containing all tools, gages and devices necessary for operating Pratt & Whitney jig borers; No. 2 Vertical Automatic completely tooled up for a production job; six-spindle vertical deep hole driller completely tooled up for a production job; complete line of gages; small tools; taps, dies, reamers, milling cutters, punches, etc.

PRODUCTO MACHINE CO., Bridgeport, Conn.—No. 50 "Producto-Matic" milling machine equipped with a four-station flat turret type of work holding fixture; No. 12 automatic single-spindle cam milling machine.

PROSSER & SON, THOMAS, 15 Gold street, New York.—"Widia" Tungsten Carbide lathe tools; planer tools; shaper tools; drills; reamers; milling cutters; boring tools; special tools.

Q-C ENGINEERING & TOOL SALES INC., 7 East Grand avenue, Detroit.—Airflex riveting hammers; "Roto" live centers; Q-C drill bushings and locating pins; quick-clamp standardized fixture units; engineering service.

RACINE TOOL & MACHINE CO., Racine, Wis.—10 x 10-inch Racine shear cut production saw; 6 x 6-inch shear cut production saw, screw feet; 6 x 6-inch gravity feed high speed saw; 4 x 4-inch Junior saw; Duplex band saw. All motor driven and in operation.

RAMSEY CHAIN CO., Albany, N. Y.—A tachometer exhibit showing lack of friction in chain; panel exhibit showing three Ramsey silent chains operating on small sprockets.

REED-PRENTICE CORP., Worcester, Mass.—No. 3 Reed-Prentice new model high speed ball bearing vertical milling and die sinking machine; 16-inch new model Reed-Prentice sliding gear head lathe; No. 5 Reed-Prentice new model vertical milling and jig boring machine.

RELIANCE ELECTRIC & ENGINEERING CO., 1088 Ivanhoe road, Cleveland.—Reliance type T heavy duty D. C. motors and fully enclosed fan cooled motors.

RICKERT-SHAFER CO., Erie, Pa.—Automatic single purpose threading machines; self-opening die heads; collapsible taps, automatic and seminautomatic tapping machines; chaser grinders; boring heads; chasers.

RIVETT LATHE & GRINDER CORP., Brighton, Boston.—Blanchard pulsating system for automatic oil lubrication for machinery; Forkup, Forkans, Forkguns for controlled oil lubrication, pressure grease appliances and systems.

ROCKFORD DRILLING MACHINE CO., Rockford, Ill.—Rockford "Two-Way" production boring machine; "Pullmore" industrial clutches.

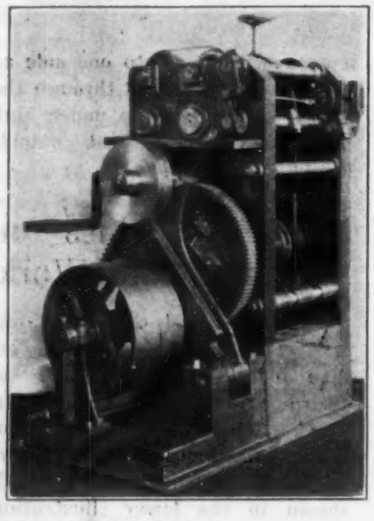
ROCKFORD MACHINE TOOL CO., Rockford, Ill.—Rockford shaper-planer, 42-inch hydraulic driven; 24-inch Rockford Hy-service shaper.

ROSS MFG. CO., Cleveland.—Mechanical emery wheel dressing and truing tools; machine cooling fluid pumps.

ROTOR AIR TOOL CO., 5704 Carnegie ave-

(*Concluded on Page* 763)

New Model Spring Coilers and Broaches



Will Exhibit Improved Spring Coiler

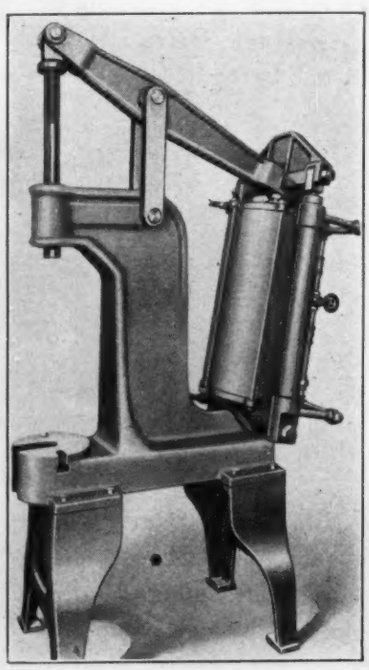
AN IMPROVED spring coiling machine will constitute the exhibit of Sleeper & Hartley Inc., Worcester, Mass. In operation a pinion on the drive shaft meshes with a crank gear, which drives an oscillating segment geared to a ratchet. The ratchet shaft drives a wire feeding device. When the segment gear moves in one direction it is obvious that each stroke of the segment gear feeds a definite amount of wire and on the return stroke the feed mechanism is stopped, affording time for cutting off the spring just completed. The machine will handle round or square wire. Ordinary compression springs of ⅛-inch wire can be made at the rate of 50 per minute. Changes from one spring form to another require 10 to 20 minutes.

To Show New Miller

A NEW automatically operated, hydraulic feed, bed-type milling machine will be exhibited by the Oesterlein Machine Co., Cincinnati. Description of the unusual details of this machine will be withheld until illustrations are available.

Broach Is Controlled Hydraulically

HANNIFIN MFG. CO., Chicago, will show an air-operated chuck, a hydro-pneumatic broaching press and an air rivet press, all new. The broach is for short holes. By employing two small oil cylinders on either side of the air power cylinder, speed control of the ram is accomplished. Regulated transfer of oil from the top to the bottom of the small cylinders gives sensitive control during the power stroke. During the return stroke, the oil passes through a swing check, permitting the ram to return to position at full speed. The broach produces 625 parts per hour on a daily average run. It is illustrated below.



Steel Treater Interest Is High During Annual Convention

Heavy Attendance a Feature of Cleveland Metal Congress and Exposition—Organization Sets Rapid Pace Among Technical Societies

HIGH interest and splendid attendance at technical sessions marked the eleventh annual convention of the American Society for Steel Treating in Cleveland, Sept. 9-13. Although the nitriding symposium of the closing day attracted the record audience of close to 600, the Campbell Memorial lecture of Dr. Albert Sauveur and the melting practice session drew noteworthy crowds. Few technical societies command member interest as does this organization of metals technicians.

Evidence of the solidarity and worth of the society was gained from annual reports of the officers. Service to industry has increased, likewise the membership gained 16 per cent and reached a total of more than 5600. Interest in the National Metal exposition, through which 50,000 people passed this year, emphasizes the rapid progress being made in the manufacture, the treatment and fabrication of metals.

Robert G. Guthrie, chief metallurgist, People's Gas Light & Coke Co., Chicago, was nominated for president of the society in 1930. At present he is vice president. Other nominations were as follows: Vice president, J. M. Watson, metallurgical engineer, Hupp Motor Car Corp., Detroit; treasurer, A. O. Fulton, president, Wheelock, Lovejoy & Co. Inc., Cambridge, Mass.; and directors, W. B. Coleman, president, W. B. Coleman Co., Philadelphia; and O. E. Harder, professor of metallography, University of Minnesota, Minneapolis.

At the banquet on Thursday evening Thomas A. Edison was made an honorary member of the society and the Howe medal was awarded to Dr. C. R. Wohrman, Bell Telephone Laboratories, New York, for excellency of a paper published in *Transactions*. The 1930 convention and exposition will be at Hotel Stevens, Chicago, Sept. 22-26.

Metallurgical Problems Varied in Nature

WITH only the formality of a few welcoming remarks of President Zay Jeffries, the week's program of technical sessions started on Monday morning. The first paper on the dilatation of steel during quenching was read by G. M. Eaton, Molybdenum Corp. of America, Pittsburgh. The author stated that transient plastic flow during quenching is the mechanism which creates residual internal stress in steel. When the rolled surface is not machined off prior to quenching this transient plastic flow is localized in weak streaks in the surface material. In alloy steels, martensitic dilatation aggravates this transient flow. Emphasis was laid on the need for alloy steels in which the quality of the surface material of the rolled bar is improved till it bears the same ratio to core characteristics that exists in carbon steels.

H. B. Knowlton, International Harvester Co., Ft. Wayne, Ind., reported on an investigation to determine the economical re-use of solid carburizing materials in case hardening. Mr. Knowlton said that the problem was attacked on the basis that the material undergoes a loss in volume during use or undergoes a change in chemical composition of physical properties. A number of carbonaceous materials were employed, barium, sodium or calcium energizers being used. Following a study of hardening effect under widely varying conditions the company was able to reduce the addition of new material from 33 to 12 per cent, the monetary saving being appreciable.

Three Steels Popular

S.A.E. 2315, 4615 and 6115 steels find widest use in automobile truck and bus gears, according to H. W. McQuaid and O. W. McMullen, Timken-Detroit Axle Co., Detroit, in a paper discussing the selection of case hardening steels for highly stressed gears. In abstracting the paper, Mr. McMullan said the object was to show the variations in the several steels and to reveal the characteristics of some of the newer steels. The gears described were made by upsetting bar stock, and for this work electric furnace steel showed greatest uniformity and less warpage in hardening.

Conclusions reached were that 4615 steel gives the hardest surface when oil quenched. Use of nickel as an alloy in steel was found to lower the surface harness when the material was oil quenched. S.A.E. steel was found to give good results when high surface hardness was not required.

In speaking at the afternoon session on conditions necessary for blistering metal during processing, Dr. Anson Hayes, chief chemist, American Rolling Mill Co., Middletown, O. directed attention to two facts that generally are overlooked. The pressure required to raise a blister is inversely proportional to the radius of the curvature of the lamination in the sheet; and, that the pressures responsible for the penetration of hydrogen during the pickling process, are due to the surface tension of the pickle liquor during the time the bubbles of hydrogen are small.

H. G. Keshian, metallurgist, Chase Companies Inc., Waterbury, Conn. in speaking on "Dendritic Steel" emphasized that the degree of dendritic structure is governed by the number and size of dendrites which seem to depend on the casting temperature of

the steel, the chemical composition and the rate of solidification. The speaker contended that in directional properties dendritic low-carbon chrome-nickel steel shows greater difference than nondendritic steel in the reduction of area, other properties being practically the same.

Refractories Is Subject

How an ordinary firebrick lining of a heating furnace can be converted into one of high-refractory character by spraying a coating of aluminum-calcium, magnesium-iron silicate, known as Albany Slip, was explained by W. J. Merten, metallurgical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. who spoke on improving refractory lining of furnaces for high-temperature annealing of steel castings. Mr. Merten mentioned that a combination of lime-borate mixed with a dilute sodium silicate, water solution and glaze applied to a steel body affords a nearly hermetical seal against excessive scaling when exposed to high temperatures. He warned, however, that there is a slight chemical scouring effect on the surface which prohibits the application of the coating with bright annealed steels.

The session closed with a paper on overheating steel for forging by W. E. Jominy, University of Michigan, Ann Arbor, Mich. The paper is part three of a series dealing with the burning and overheating of steel.

Three papers on steelmaking and melting practice and one on locomotive forgings featured the well-attended Tuesday morning session. As might be anticipated, interest was high and considerable discussion resulted.

George Batty, research director, Steel Castings Development bureau, Philadelphia, described the methods applied in melting and finishing a heat of electric steel for castings. He discussed the processes for both plain carbon and alloy steels and emphasized that where scrap contaminated by adherent sand is used as part of the charge, a definite boil of the bath must be secured with some inevitable carbon elimination in order that finely divided nonmetallics be cleansed out. To kill off the final traces of free and active oxide of iron in the bath with ferrosilicon was branded as neither sound nor desirable practice.

Slags produced in steelmaking and their effects on the product and the process was the subject discussed in a paper by George A. Dornin, Gathmann Engineering Co., Baltimore. The author called attention to the flaws and lack of reliable uniformity that must follow in steel made by processes that attempt to finish and refine under slags carrying iron oxides. He was of the opinion that reducing slags are not necessary but only that the finishing slag must carry no iron oxides; that the reduction of FeO in the bath can be accomplished most cheaply in a large way by addition of deoxidizers which must be done so FeO is not fluxed out into the slag.

H. P. Rassbach, melting department, Midvale Co., Philadelphia, read a paper outlining the melting practice for three types of electric steel, namely, carbon tool steel, chromium-vanadium steel and high-speed steel. Among the points discussed were selection of scrap; slag conditions at various stages; slag and metal analyses; importance of deoxidizing the slag to a high degree; and general furnace practice.

Describes Forging Practice

The concluding paper was read by Lawford H. Fry, metallurgical engineer, Standard Steel Works Co., Burnham, Pa., who dealt with the production of locomotive forgings. To give good results in service these forgings must undergo correct methods from the melting of the steel to the finished product. Comparing the various melting processes, Mr. Fry considered the importance of ingot structure. Forging practice was described and the various types of steels enumerated. Necessity for proper heat treatment was pointed out.

Mr. Fry stated that although good steel is made by the basic process, the acid process provides better material for forgings. This point caused much disagreement and several people discussed that point. E. J. Edwards, American Locomotive Co., Schenectady, N. Y., said that railroads are on the wrong track in seeking higher strength steels instead of improved and positive lubrication. No steel can be developed, which will stand up when lubrication fails, he stated.

Organization Expanding in Size and Service

THE annual business meeting occupied the early part of the Wednesday morning session, with President Zay Jeffries presiding. That the organization continues to expand in membership, finances and service was the substance of all officers' reports.

Secretary W. H. Eisenman stated that on Aug. 31, the society had 5615 members which compared with the 4844 of one year ago was an increase of 16 per cent. In no year has the membership failed to show gain, but the expansion of 1928 was only 4.1 per cent. Plans are shaping up for the publication of the second edition of the *Handbook* in 1930. This volume will contain over 200 pages of new material and older material will be revised.

The report of Treasurer J. H. Watson revealed that the society's net worth increased 20 per cent in the first seven months of 1929, every department having shown an excess of income over expense. Mr. Watson revealed that whereas the average receipt per member was $12.35, the average cost of direct service per member was $27.27.

Reviews Society's Growth

Dr. Zay Jeffries, in the annual report of president, reviewed the continued growth of the society and pointed out the efforts which have been made to co-operate with other technical organizations in providing a common service to the metal industry.

President Jeffries presented the R. M. Bird bell and gavel to the Los Angeles chapter for its assistance to the national officers, excellence of organization and progressiveness in educational features, the reward being made largely in recognition of that chapter's co-operation in the Western Metal congress and exposition.

Before an audience of about 600, Dr. Albert Sauveur, professor of metallurgy, Harvard university, Cambridge, Mass., presented the fourth annual Edward deMille Campbell memorial lecture. The subject of the address was the behavior of steel at elevated temperatures.

Dr. Sauveur described tests which had been made in the metallurgical laboratories at Harvard university. Various types of steels such as ingot iron, carbon steels, chromium steels, nickel steels and the like were machined into test bars and gripped in a specially devised twisting machine. Surrounding the test bar, a section of the center of which had been machined out to ½-inch diameter, was placed an electric furnace, providing close control of tempera-

ture. One end of the test bar was clamped and the other turned, thus twisting the bar as it was being heated. Curves were prepared showing the effect of increasing temperature on torsion, twist and factor of stiffness. Interesting results were forthcoming, showing many marked discontinuities in the various curves, for a few of which Dr. Sauveur offered explanations.

Blue heat brittleness, red shortness and other phenomena were shown to have some bearing on the various curves. Dr. Sauveur also pointed out that red shortness is peculiar solely to gamma iron. As an interesting adjunct, the author grouped all the curves of several steels for one factor such as twist, on one graph, showing many interesting peculiarities of high temperature effects on physical properties.

Methods for determining the machinability of metals were outlined in a paper presented by O. W. Boston, director of engineering shops, University of Michigan, Ann Arbor, Mich., at the Tuesday afternoon session. A series of experiments were made on 18 ferrous and 21 nonferrous metals to determine whether or not the materials were suitable for machining purposes. An attempt was made to show relation between hardness and other factors and machining qualities.

The second paper presented by W. P. Sykes, Cleveland Wire division, General Electric Co., and prepared in collaboration with A. C. Ellsworth, Aluminum Co. of America, Cleveland, discussed the distribution of hardness produced by cold working, a preliminary study of the progress of hardening throughout the section, produced by cold working. Copper, ingot iron and an iron tungsten alloy were swaged to various degrees and the change in hardness at various depths below the surface of a round section noted. The effects of starting diameter and original hardness were reported.

X-ray Spectograms Shown

N. P. Goss, American Steel & Wire Co., Cleveland, presented several X-ray spectograms which he claimed illustrated the importance of skin depth and grain size upon the resulting hardness after swaging. That the relative malleability rather than original hardness was a determining factor was the contention of J. E. Armour, Union Drawn Steel Co., Beaver Falls, Pa.

A paper on the inherent hardenability characteristics of tool steel, by B. F. Shepherd, Ingersoll-Rand Co., Phillipsburgh, N. J., described an interesting process for noting the hardness variations in specimens of tool steel by grinding slabs in a series of steps varying in thickness by 1/64-inch intervals and then quenching in a spray and noting the hardened case by fracture. Mr. Shepherd sought to devise some measuring stick for tool steel hardness and found that even in steels of identical chemical analyses, the hardness varied considerably. He found no connection between chemical composition and hardness and advocated the buying of steel by the former method of brand name rather than by specifications.

G. V. Luerssen, Carpenter Steel Co., Reading, Pa., presented the final paper on the behavior of carbon tool steel on quenching. This paper, bringing out through a series of illustrations the several characteristic conditions of quenching range and hardness penetration which may exist in carbon tool steel, showed the need for uniformity of hardening characteristics.

Magnetic Testing Method Arouses Discussion

A PAPER on hot aqueous solutions for quenching steels, by H. J. French, International Nickel Co., New York, and T. E. Hamill, junior metallurgist, bureau of standards, Washington, opened the Thursday morning program. The authors gave surface and center cooling curves for small cylinders of high-carbon steel quenched in water, sodium hydroxide, sodium chloride solutions and oils at different temperatures. Results suggested the possibility of using some of the hot aqueous solutions to bridge the gap between the cooling rates obtained with water and oils at atmospheric temperatures.

Provide Useful Coolants

Experiments with carbon and alloy steel tensile test specimens and gages seemed to justify the view that hot aqueous solutions can provide a useful group of coolants with graded cooling characteristics for the hardening of small pieces.

V. N. Krivobok, association of metallurgy, Carnegie Institute of Technology, Pittsburgh, abstracted a highly theoretical paper on a study of the iron-chromium-carbon constitutional diagram, prepared with the assistance of M. A. Grossmann, chief metallurgical engineer, Central Alloy Steel Corp., Canton, O. The work was an examination of the changes in the microstructure of the alloys caused by variations in the chromium content with various carbon contents.

The most interesting paper of the session was one on nondestructive testing prepared by E. A. Sperry, president, Sperry Development Co. Inc., Brooklyn, N. Y., and abstracted by H. C. Drake, chief engineer of the Sperry organization. The work described was in the detection of internal transverse fissures in steel rails through the use of specially-constructed test cars which pass a direct current of high amperage through the rail and measures the deviation in the axis of the current flow caused by flaws. The method is claimed to be adaptable to inspection of a wide variety of products.

In discussion, E. W. Carrothers, Pennsylvania Railroad Co., Altoona, Pa., although admitting the method had possibilities, stated that the work was too slow and an excessive number of test cars would be necessary to inspect track even at intervals of 30 days. Some of the difficulties of the process were pointed out. A written discussion by W. C. Barnes, chairman of the rail test committee of the American Railway association, commended Mr. Sperry's development and stated that results had been particularly gratifying. The Railway association has assisted in investigational work on several railroads and many defective rails had been found defective and had been replaced. Mr. Barnes expressed the belief that as development of the equipment progressed, better results would be secured. Robert Job, Milton-Hersey Co., Montreal, also spoke favorably of the process and believed it will find wider application in the future.

Difficulties Overcome

Replying to the discussion, Mr. Drake pointed out that Mr. Carrothers' criticisms were based on observations of the equipment as originally developed and said many of the difficulties first encountered had been overcome. He revealed that whereas rails coming from the mill were found without flaws, after being placed in service fissures were found as soon as six weeks after or as long as 15 years after.

The final paper of the session was prepared by H. H. Lester, research physicist, Watertown arsenal, Water-

town, Mass., and concerned the brittle range of iron containing 18 per cent chromium and 8 per cent nickel.

Cast iron formed the subject matter for half of the Thursday afternoon program, two of the four papers being about that metal. The first, presented by H. A. Schwartz, director of research, National Malleable & Steel Castings, Co., Cleveland, was on "Graphitization of Prequenched White Cast Iron." H. H. Johnson and C. H. Junge, of his research staff, collaborated on preparing the paper.

"Austenite and Its Decomposition" was the topic of the paper by Dr. Albert Sauveur, Harvard university, Cambridge, Mass. He discussed the mechanism of transformation of austenite. Recent theories on the hardening of steel by quenching, such as grain size and distortion and dispersion, were outlined. This paper was followed by lengthy and interesting discussion.

Discusses Cast Iron

The mere addition of alloys to cast iron is not a means of producing high-strength cast iron from inferior irons, according to E. J. Lowry, consulting engineer, Detroit. He presented a paper entitled "High-Strength Cast Iron." Seeming delinquency of American foundrymen in not producing high test cast irons was explained by Mr. Lowry. He claimed that present machine tool methods with high speeds and feeds do not adapt themselves readily to high-test irons.

Three necessities for high-strength iron are correct melting temperature, proper mixture of all materials and correct mold pouring temperature. This opinion was advanced in the discussion written by F. B. Seiping, Michigan State College of Agriculture and Applied Science, East Lansing, Mich.

The final paper of this session was "Crystal Structure of an Iron Phosphide," presented by James B. Friauf, Carnegie Institute of Technology, Pittsburgh.

Nitriding Session Holds Greatest Interest

THE nitriding process for hardening steels has attracted wide attention during the past year, consequently the Friday morning and afternoon sessions were conducted as symposiums on this important subject. These two meetings were the best attended of the week, no less than 500 at each session listening to the reading of papers and open discussion.

At the morning portion of the symposium, four papers were abstracted briefly. H. H. Lester, Watertown Arsenal, Watertown, Mass., told of investigational work on the white layer in gun tubes; Samuel Epstein, Illinois Steel Co., South Chicago, Ill., reviewed the iron-nitrogen system; V. O. Homerberg and J. P. Walsted, Massachusetts Institute of Technology, Cambridge, Mass., reported on a study of the nitriding process; and Dr. O. E. Harder, J. T. Gow and L. A. Willey, University of Minnesota, Minneapolis, gave results of a research on nitriding steels.

Dr. Homerberg described the nitriding process in simple language and pointed numerous advantages among which were the fact that nitrided steel retains its hardness at elevated temperatures and that no distortion occurs during hardening. Best results are obtained between 800 and 1400 degrees Fahr. Small amounts of aluminum seem to improve hardening results. Grain size of a steel is not influenced by nitriding. In concluding, Dr. Homerberg warned that there must be no decarburization present in the steel before hardening, otherwise brittleness and spalling will occur.

Dr. Harder's paper reported work being done in an extended research to determine the types of steels which are best suited for nitriding. Further work is to be done in that connection.

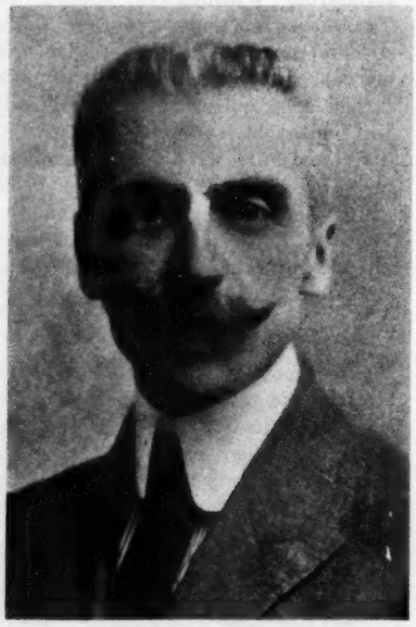
The morning half of the symosium ended with Dr. Adolph Fry, Krupp Research Laboratories, Essen, Germany, speaking briefly in an effort to show what is now common knowledge in the process and what additional knowledge is needed. Among the nitriding advantages are the lack of distortion, no change in physical properties due to hardening, hardness and wear resistance higher than those given in any other process, hardness not affected by drawing, and rust resistance of the nitrided surface. Dr. Fry warned that high temperatures must be avoided, as no greater hardness is obtained and cracks frequently occur.

Two papers were presented at this session on the subject of nitriding. Robert Sergeson, Central Alloy Steel Co., Canton, O., described investigations in this process. The first part of the paper dealt with analyses of alloys and comparisons with carburizing; the second on data of the flow of ammonia gas and temperature and some account of the duplex process; the third with decarburizing and brittleness. He concludes that for the first

(Concluded on Page 766)

DR. ADOLPH FRY

Who discussed the nitriding process for hardening steel at the Friday morning symposium. Dr. Fry is head of the research department, Freid. Krupp A. G., Essen, Germany



P. F. M. AUBERT

Owner of extensive Krupp patent rights exclusive of Germany. Mr. Aubert came from Paris with Dr. Fry to attend the National Metal Congress in Cleveland

American Welding Society Reviews and Studies New Trends

Ninth Annual Fall Meeting Is Held in Cleveland in Connection with National Metal Congress—Tenth Anniversary of Organization Celebrated

A DECADE of service to the welding industry was completed last week when the American Welding society in conducting its annual fall meeting in Cleveland, Sept. 10-13, celebrated its founding ten years ago. The organization now has 13 local sections. In the numerous technical papers presented before well-attended sessions, the application of welding and its rapid march to the front rank as a method of fabricating metals was reviewed comprehensively.

With some 350 members and guests of the society registered, interest and enthusiasm characterized each session. Among features of the program were a conference of research workers on fundamentals of welding, a meeting of the American bureau of welding, a joint session with the American Society of Mechanical Engineers, and annual banquet on Thursday evening.

The American Welding society is contributing continuously to the advancement of welding science. Through its co-operation tests are carried on at university and commercial laboratories and from this work a wealth of stimulating information and data are obtained.

Study Methods for Testing Weld Soundness

SESSIONS of the Welding society started on Tuesday morning with a brief business session, President F. T. Llewellyn occupying the chair. This was followed by a short welcome from W. R. Hopkins, Cleveland city manager, after which attention was directed to technical papers and discussion.

The effect on design of the use of welding in the manufacture of electric machinery was related in the first paper by H. G. Reist, General Electric Co., Schenectady, N. Y. Briefly tracing the history of the use of structural steel in construction of machinery, the author stated that stator frames of induction motors for ship propulsion were built in 1912 by combining cast-steel rings of I-beam section with a sheet of boiler plate riveted to the outer circumference. The construction worked out so well that it formed the basis some years later for the design of steam turbine generator armature frames.

In the discussion which followed, the relation of this method of fabrication to appearance was considered at length. President Llewellyn is of the opinion that while function is uppermost, beauty will be attained by study of the fundamentals. J. W. Owens, Newport News Shipbuilding & Drydock Co., Newport News, Va., discussing costs, warned that they should be considered as a whole rather than in part, and should be studied carefully or welding will be hampered.

Experiences in connection with cutting and welding parts were reviewed in a paper read by W. J. Buchanan, Cooper-Bessemer Co., Grove City, Pa. Success of machine cutting with oxy-acetylene flames lies in its adoption by manufacturers for routine work, he said.

Paper Names Difficulties

Many of the difficulties encountered in the process of welding copper were touched upon in a paper on welding of copper and high copper alloys presented at the Tuesday afternoon session. I. T. Hook, author of the paper, explained that the extraordinarily high conductivity of copper influences the welder, where possible, to seek other materials which are easier to manipulate. A satisfactory weld may be obtained on electrolytic copper by the use of a silicon-manganese-copper welding rod, this having a slightly lower melting point than that of the copper, while at the same time providing adequate strength.

The second paper at this session, presented by F. G. Tatnall, Southwark Foundry & Machine Co., Philadelphia, and describing how to test welds, centered chiefly around the various instruments and methods employed for this purpose. The author believes that in the tensile test of a weld, ultimate strength should be the chief consideration because the elastic limit, yield point, and elongation practically always appear in the base metal or as a composite of both the weld and base metal.

The bend test always should be used in conjunction with the tensile test as this shows the ductility of the specimen weld; measurements of stress distribution in welded structures also should be taken.

Extent of progress made by research workers on the fundamentals of welding was reported at a conference held Wednesday morning. Considerable data on fatigue tests of different types of welds was given by Prof. J. H. Thornton, Washington State college, Seattle. Of the specimens submitted to him for testing, the resistence weld produced the best results. Gas welds also held up well, he told his audience. Atomic hydrogen welds, however, were the least successful. Reasons for failure as outlined by Prof. Thornton, consisted primarily of lack of penetration and absence of heat at the bottom of the vee. He is inclined to believe that the shape of the notches in some in-

stances were at fault in failing welds.

Tests were conducted on a rotating beam machine carrying a concentrated load. He said he had not succeeded in getting any of the samples of metallic arc welds submitted to him to stand up under the fatigue test. However, one metallic arc weld went one hundred million cycles without breaking, proving that it was a high quality joint. All specimens given the test were firebox steel.

Prof. Gilbert Dean, assistant professor of metallurgy, Lehigh university, Bethlehem, Pa., explained that pure iron welding wire is being tried with the hope of discovering how this type of material actually welds.

Test Shows Tendencies

A study of stresses in welded rail joints was presented by Prof. Thomas R. Lawson, Rensselaer Polytechnic Institute, Troy, N. Y. Professor Lawson said he was not interested particularly in the nature of the welds as in the question whether the deformation represented internal stresses. While no definite conclusions have been reached in this test certain tendencies explained by him, have developed.

A progress report of what is being done by the structural steel welding committee of the American Welding Society was given by the chairman, J. H. Edwards, chief engineer, American Bridge Co., New York, at a meeting of the committee Wednesday evening. According to the report 40 structural steel companies are cooperating in research work. Of the companies conducting tests, 10 have completed them and nine are at work or awaiting the qualifications tests. Specimens to be welded number 1677, and 912 have been released. Six hundred have been shipped to 20 commercial and university laboratories.

At the Wednesday afternoon session a paper was presented in the form of a preliminary report on the presence of so-called nitride needles in welds. The term "so-called" was used because the author, P. P. Alexander, research engineer, General Electric Co., Lynn, Mass., believed that, following much investigation, the needles could be accounted for by contamination from oxygen in the air surrounding the weld rather than from the introduction of nitrogen. Evidence of corroboration was obtained from the fact that the needles are removable by annealing the samples in a hydrogen furnace.

The second paper, prepared by G. E. Doan and E. Ekholm, was presented by Professor Doan of Lehigh university. The chief thought behind this paper appeared to be to disprove the generally accepted belief that carbon arc welds in steel are brittle because the steel absorbs carbon from the electrode. Facts and figures resulting from considerable investigation were given to show that only in welds on which was used as short an arc as 1/16-inch or so in length was there any tendency to absorb carbon; this absorption could be accounted for by physical contact between the incandescent tip of the arc and the weld metal. On the other hand, where arcs longer than 1/16-inch were employed, the tendency was to decarbonize the weld.

In the final paper, which was presented by Prof. H. M. Boylston, Case School of Applied Science, Cleveland, the metallography of some metallic arc welds was discussed fully. Many interesting conclusions were drawn from the investigation among which should be mentioned: Use of a short arc appears to produce a stronger weld metal than a long arc, no matter what arc temperature may be; combination of high temperature and short arc seems to give the best ductility and highest allowable working stress; and use of a long arc apparently produces greater porosity in the deposited metal than a short arc.

Methods of nondestructive testing of welds applicable to plate, pressure vessels, pipe joints and structural steel joints were discussed in a paper presented by A. B. Kinzel, Union Carbide & Carbon Research Laboratories Inc., Long Island, New York, at the Thursday morning meeting. In this paper, C. O. Burgess and A. R. Lytle, both of the same affiliation, collaborated with Mr. Kinzel. The essential method of proceeding with the tests consists of first detecting by means of a stethoscope, the presence of any spots in the weld that are different in character from a satisfactory joint, and second, in obtaining X-ray photographs of these spots to determine the seriousness of the deviation from normal.

Examined by Stethoscope

Procedure with X-ray apparatus was explained. In concluding, he stated that the general plan for a complete method of nondestructive testing of pressure vessels consists in going over the welded joints with the stethoscope and then making X-ray examinations of any points in question.

Welding studies at the Watertown arsenal were described by Major J. B. Rose, ordnance department, United States army, Watertown, Mass. In tests of electric arc hand welds with welding rod of carbon content, the best results were obtained with unannealed specimens, according to Major Rose. X-ray examination of experimental welds and of production work has been of the greatest value in revealing use of improper materials and poor methods of workmanship, that is in checking on technique in every aspect.

Prof. J. Hammond Smith, University of Pittsburgh, Pittsburgh, gave a paper outlining stress-strain characteristics of welded joints. He demonstrated a strain measuring instrument with setting support. Since strength and rigidity are the paramount factors in the physical makeup of all materials, all investigations tending to determine and improve these qualities according to the characteristics desired are important developments, Professor Smith said.

Hold Joint Session

A joint technical session with the American Society of Mechanical Engineers constituted the activities of the American Welding Society Thursday afternoon. The account of this session will be found on page 731 of this issue of IRON TRADE REVIEW.

Interest and enthusiasm were high at the concluding session on Friday at which three papers were presented. W. R. Ost, Air-Reduction Sales Co., New York, described oxyacetylene welding of pipe lines in the field. His paper dealt with the practical aspects of laying welded pipe lines in open country, using for illustration, 45 miles of pipe connecting two cities in the mid-west. On this work 10-inch pipe in 40 foot lengths were welded at the rate of one mile per day by 14 welders.

Another paper describing the same type of work, that of welding oil and gas pipe lines in the field but using electric welding instead of oxyacetylene was given by H. C. Price, general manager, Welding Engineering Co., Bartlesville, Okla. In this paper the author outlined electric arc welding of 2500 miles of pipe line during the past 12 months. Of this total, Mr. Price said, 1000 miles were in Texas, Oklahoma, Missouri, Illinois, and New Mexico. The pipe varied from 6 to 12 inches in diameter, while the welded lines ranged from 50 to 424 miles in length.

H. A. Woofter, Swift Electric Welder Co., Detroit, read a paper on the welding of tubing and pipes for locomotives and boilers. He showed in his introduction the importance of pipe to civilization. The resistance welding process formed the background of his discussion.

Concluding the meeting of the Welding society, the American Bureau of Welding met Friday afternoon to re-

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Mechanical Engineers Review Iron and Steelworks' Problems

Use of Coke Oven Gas and Application of Alloy Steels to Mill Equipment Are Minimizing Operating Costs

FEW new blast furnaces will be built in the future because it is more economical to increase the size of present installations, according to Arthur G. McKee, president, Arthur G. McKee & Co., Cleveland, who spoke on "Developments in Blast Furnace Design and Practice" at the opening technical session of the iron and steel division, American Society of Mechanical Engineers held in Cleveland, Sept. 11.

Mr. McKee directed attention to the trend toward larger blast furnaces and the wider use of blast furnace gas for heating coke ovens, open-hearth furnaces and heating furnaces. The inauguration of underfiring coke ovens with blast furnace gas, he stated, not only has afforded the sale of coke oven gas but has given a coke of more uniform quality, which when used for smelting, has led to an improvement in furnace practice.

Safety Is Required

Alexander C. Brown, president, Industrial Brown Hoist Corp., Cleveland, in speaking on "Ore-Handling Bridges," asserted that stability and safety of an ore bridge to withstand wind storms of high velocity has become a requirement of primary importance. The inverted pier has come into general usage and not only saves storage room but increases the safety factor. The speaker advocated the square-shaft travel mechanism because it more nearly keeps the bridge in alignment and provides safety in high winds. The design of properly constructed solid foundations and use of heavy runway rails cannot be too strongly emphasized, he stated.

The session closed with a paper by W. L. Garrison, assistant manager, locomotive department, Ingersoll-Rand Co., New York, who spoke on "Oil-Electric Locomotives in Steel Mill Transportation." Oil-electric locomotives will perform most yard switching service with smaller horsepower rating than is required of the steam locomotive, he contended. In speaking on the maintenance of this type unit he told of one mill that in 1928 showed an average repair cost per locomotive hour of $0.56, as against $1.07 for former steam equipment.

At a joint session of the American Welding society and the iron and steel division Thursday afternoon the opening paper on nondestructive testing of welds by E. A. Sperry, president, Sperry Development Co., Brooklyn, N. Y., and presented by H. C. Drake, chief engineer of the Sperry company, explained how electrical inspection may be applied to welded structural steel buildings or welded steel ships. The method involves the use of a 5-kilowatt welding set combined with a compact amplifying and recording equipment. The unit is handled easily by crane and can follow the progress of the welding, making an accurate ink record of the soundness of the work and indicating any spots where the weld is defective.

W. L. Warner, industrial heating and welding engineering department, General Electric Co., Schenectady, N. Y. in speaking on automatic are welding of thin sheets asserted that probably more radical changes take place during the brief time interval required to effect a thorough fusion between parts to be welded than in any other equivalent cycle of metal handling. The change from room temperature to the molten condition is almost instantaneous and the cooling cycle is short due to the local extent of the melting zone. This means, he stated, that the metal is heated above the melting point and returned again to a solid condition in a few seconds.

Offsets Former Objections

The final paper, on foreign practice in welding boiler tubes and drums, by G. A. Orrok, consulting engineer, New York, revealed that both electric and oxyacetylene welding are used in Europe for high-pressure shells. After citing the lack of resiliency and the welder's skill factor as the two objections to welded joints, the speaker emphasized that improved welding methods, proper inspection, accumulated experience and test data have done much to offset these. This especially is evident in Germany, he declared, where extensive welding has been adopted in the construction of hulls of warships.

Track wheels for cranes, coke pushers, soaking pit covers and ingot cars now are being made of a chrome-nickel-molybdenum steel that gives eight times the life obtained with ordinary carbon wheels. This fact was disclosed at the session Friday morning, by E. R. Johnson, Central Alloy Steel Corp., Massillon, O., who as co-author with O. Bamberger, associated with the same company, presented a paper on alloy steels in iron and steel mill equipment.

Affords Prolonged Usage

Mr. Johnson pointed out that at a blast furnace boiler house stainless steel tubes for soot blowing have been installed which will not develop the excessive grain growth with subsequent cracking. In conclusion the speaker mentioned that the tonnage of alloy steel required for steel mill equipment at one particular plant is approximately 100 tons a month. Its use, he asserted, has decreased costly breakdowns.

K. Feller, branch manager, Schloemann Engineering Co., Pittsburgh, in speaking on the evolution of drives for mill table rollers paid tribute to John Fritz who first applied power to mill rolls in 1857. The speaker stated that 44-inch blooming mills as early as 1900 were handling ingots weighing 6000 pounds. The recently developed motor roller, which may be reversed, stopped or accelerated within a few seconds, was described. One installation now is being constructed to handle superimposed loads of 1700 pounds per roller.

G. C. Farkell, superintendent rolling mills, National Tube Co., Lorain,

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Mining Engineers Disclose Recent Progress in Metallurgy

Manufacture of Wrought Iron by the Shotting Process and Blast Furnace Filling Methods Are Important Contributions

PROVOKING wide discussion at the opening session of the iron and steel division American Institute of Mining and Metallurgical Engineers, Sept. 10, was the paper of Dr. James Aston, A. M. Byers Co., Pittsburgh, describing his process for making puddled iron. In discussing the history of puddled iron and the reasons for previous failures, Dr. Aston claimed the crux of the problem was the disintegration of the metallic mass. He explained how this was accomplished in introducing molten iron of 2700 to 2800 degrees Fahr. into siliceous slag of 2300 degrees, making for faster solidification and faster gasification. This is accomplished so rapidly that the iron is shotted.

Written discussion by H. D. Hibbard, Plainfield, N. J., raised the question as to whether this wrought iron really was puddled and mentioned the time of contact of iron and slag. Dr. Aston replied that the question of what puddled iron is, depends upon definition, generally associated with the type of equipment used and not the sequence of processes. Dr. C. H. Herty Jr., bureau of mines, Pittsburgh, claimed that Mr. Hibbard had overlooked the fact that the type of slag was more important than the quantity.

Occur Simultaneously

B. A. Rogers, Western Electric Co., Chicago, in speaking on "Change in Microstructure of Iron at A_3 Transformation Point," stated that from the results of a series of tests on ten samples there is little reason to doubt that the change of microstructure occurs simultaneously with the A_3 transformation.

T. L. Joseph, bureau of mines, Minneapolis, presented a paper on "Blast Furnace Filling and Size Aggregation" on the preparation of which he and C. C. Furnas had collaborated. He presented slides showing the results of various experiments which had been conducted. Speeding up the movement of the bell, the angle of the bell, distance of bell to stock line, and the effects of splitting, or alternating the charge were discussed. The mixed charge increases size of particles in center as compared with normal layer charge. The deeper angle bell gives better characteristics and the matter of bell clearance is important, he claimed.

Pays Tribute to Authors

Arthur G. McKee, president, Arthur G. McKee & Co., Cleveland, in commenting on this paper said that this is the one big contribution to the art of smelting iron since the work of Bell. He said it showed the desirability of size of particles, the need for a steeper bell, a quicker bell in speed of travel, and of the need of decreasing the amount of flue dust produced.

Dr. H. W. Gillett, director, Battelle Memorial institute, Columbus, O., and F. T. Taylor, vice president, Hanson, Van Winkle, Munning Co., Cleveland were the principal speakers at the joint dinner of the institute of metals and iron and steel divisions of the American Institute of Mining Engineers served at Hotel Cleveland, Tuesday evening.

In explaining the work which the newly established Battelle institute expects to accomplish Dr. Gillet said the organization will concentrate on research in metallurgy and fuels and that the institute welcomes problems which may be attacked. Mr. Taylor directed attention to the wide outlet which electroplating affords distributors of nonferrous metals and cited the various coatings used in electroplating work. He pointed out that 17 per cent of all silver produced is consumed by the silver plating industry.

"Iron ore resources of the world will last as long as man can conceive," Charles Hart, Delaware River Steel Co., Chester, Pa., told those who attended the Wednesday morning session. Mr. Hart read a paper on "Foreign Iron Ores," and his conclusion was that "the world's supply of ore is without limit, and even to a greater extent the same conditions holds for the United States."

G. M. Schwartz, department of geology and mineralogy, University of Minnesota, in a paper on "Iron-ore Sinter" presented results of microscopical examination of a large number of specimens of sinter.

"Only a few years ago it was generally stated by blast furnace operators that only a limited amount of sintered iron ore could be used to advantage in blast furnaces; that when the burden was increased much above 30 per cent trouble developed," he said. "Recent blast furnace operations have been reported in which sinter made up the entire ore charge. The results have been exceedingly favorable, as by using sinter it was possible to double practically the rated capacity of the furnace and materially reduce coke consumption.

Carl Zapffe, geologist, Northern Pacific railroad, Brainerd, Minn., explained some of the details of the Bradley process for beneficiating manganiferous ores. "The object of the process is to free manganese oxide from its associated gangue and separate the contained iron oxide by dissolving the manganese and precipitating it from the solution," he said. "A plant of commercial size is not yet in operation, but a complete design has been prepared for its construction."

Cites Uses of Fluorspar

Although fluorspar has many uses in the metallurgical, ceramic and chemical industries, its most important one is the manufacture of steel by the basic open-hearth process, according to E. L. Brokenshire, Oglebay, Norton & Co., Cleveland, who presented a paper on the subject. Eighty to 85 per cent of the American consumption is used as a flux in this process, he said.

Two papers were presented at the Thursday afternoon session of the iron

and steel division, American Institute of Mining and Metallurgical Engineers. "Diffusion of Iron Oxide from Slag to Metal in the Open-Hearth Process," was the subject of that presented by C. J. Herty Jr., physical chemist, bureau of mines, Pittsburgh. "Experimental Determination of Equilibrium in the System Iron Oxide-carbon in Molten Iron," was the subject of the paper presented by A. B. Kinzel and J. J. Egan, Union Carbon & Carbide Research Laboratories Inc., New York.

Mr. Herty presented data on the rate of oxidation of silicon used in the open hearth as a deoxidizer to show fundamental principles governing diffusion of FeO from slag to metal. "In making rimming steel it is the utmost importance that the metal shall give off gas at a definite rate during solidification in the ingot mold," he said. "This rate is a function of how fast gas is being formed in the furnace, and this depends on the rate of diffusion of iron oxide from slag to metal. Once the film coefficients are known and viscosities of various types of slag are determined, the rate of oxidation of the metal will be under much closer control than is possible at present."

In discussing the reaction of iron oxide and carbon in molten steel, Mr. Kinzel and Mr. Egan described a method of determining the weight-concentration equilibrium constant.

Engineers Review Timely Operating Problems

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O., in presenting a preliminary report of the society's research committee on heavy-duty antifriction bearings, stated that a two-year fellowship will be established at the Carnegie Institute of Technology, Pittsburgh, for the purpose of gathering data from mills in regard to roller bearings and of testing and checking the data. A subject to be considered at the fall meeting of the iron and steel division will be the feasibility of establishing a research on hot saws for the purpose of formulating standards on peripheral speed, shape of tooth and amount of power.

Uniform heat supply is not usually obtained by uniform distribution of port area in furnaces of the underfired type, according to M. H. Mawhinney, Electric Furnace Co., Salem, O. who spoke at the afternoon session Friday, on distribution of heat in combustion furnaces. He emphasized that for any furnace fired from the side, a baffle wall between the burners and the heating chamber is desirable at all temperatures below 1900 degrees Fahr. For uniform temperature control, the speaker warned, direct firing should not be used at any temperature below 1900 degrees.

The final paper, on producer gas and other fuels, was presented by Victor Windett, manager, gas producer division, Wellman-Seaver-Morgan Co., Cleveland. His paper dealt with operating conditions and costs of making gas. The value of producer gas, he stated, depends on the culorific value, the sensible heat and the heat due to the calorific value and the sensible heat of the tar vapor swept into the furnace by the hot gas. The quantity of tar, he asserted, depends on the producer temperature, the characteristics of the coal, and as to its delivery into the furnace, on the gas velocity and the degree of insulation of the flues.

A. O. Smith Corp., Milwaukee, has tested a new tank car container for the transportation of helium gas.

Institute of Metals Hears Papers on Methods for Detecting Flaws

SEVERAL hundred members of the institute of metals division of the American Institute of Mining and Metallurgical Engineers gathered in Cleveland, Sept. 10-12, for a three-day meeting in connection with the National Metal congress. Three technical sessions were conducted, two of which were devoted exclusively to problems of the nonferrous branch of metallurgy.

The most important session, from the iron and steel standpoint, was the joint meeting with the American Society for Steel Treating on Wednesday afternoon. The effects of cold working on the physical properties of metals was one of the topics at that time with a paper on the subject being presented by R. L. Templin, Aluminum Co. of America, New Kensington, Pa. The author had worked out a series of formulas for use in preparing a family of curves representing the relation between cold-working and various physical properties.

Preparation of microsections of tungsten carbide for metallographic examination was described in a paper by Dr. S. L. Hoyt, General Electric Co., Schenectady, N. Y. Essential steps in the work include lapping on a copper disk with boron carbide moistened with kerosene, and then lapping on a wooden lap with diamond dust. Dr. Hoyt stated that a section 1-centimeter square could be surfaced satisfactorily in from 5 to 15 minutes. Diamond dust consumed in the process is about one carat for 1000 square centimeters of surface.

Radiography as a tool in the metal industry was described in a paper read by W. L. Fink, Aluminum Co. of America, Cleveland, and prepared in collaboration with R. S. Archer of the same company. The process is suitable for the detection of flaws and microscopic defects in castings. H. H. Lester, Watertown arsenal, Watertown, Mass., recommended investigation of the method of manufacture as a means to eliminate defects.

Determination of orientation of crystals in rolled metal from X-ray patterns taken by the monochramotic pin-hole method was described in a paper by M. L. Fuller, New Jersey Zinc Co., Palmerton, Pa. Dr. Wheeler P. Davey, Pennsylvania State college, State Collegs, Pa., and C. C. Nitchie, also of the New Jersey company, assisted in preparation of the paper.

Descriptive Paper Interesting

A paper dealing wth the reclamation of nonferrous scrap metals at manufacturing plants and prepared by F. N. Flynn, metallurgist, Milwaukee, was received with interest. The manuscript described the remelting of all borings, turnings, punchings, etc., in a brick-lined cupola, with a resulting metal of exceptional purity.

What effect alloying has on the permissible fiber stress in corrugated zinc roofing was discussed by E. A. Anderson, New Jersey Zinc Co., Palmerton, Pa. His paper dealt with a series of experiments made leading up to the development of an alloy of zinc capable of sustaining a fiber stress of 10,000 pounds per square inch, required in 13-gage zinc roofing spaced on 54-inch spans. Additions of 1 per cent copper and 0.01 per cent magnesium were found to produce a satisfactory alloy for the roofing material.

Mirrors of Motordom

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appraises the merger situation from the standpoint of self-interest. Should the Republic, Youngstown, Central Alloy, Donner, Inland, Otis, Union Drawn, Bourne-Fuller and Corrigan-McKinney companies be brought together, or even loosely associated, there would be a much closer concentration of the automobile industry's sources of supply for steel. It is too strong to say that the automobile industry views the situation with concern, but the fewer the producers the fewer the opportunities for searching out soft spots in the price situation.

It is recalled here that after the formation of the United States Steel Corp. in 1901 a number of small plants sprang up, some being the progenitors of companies now discussed in the proposed independent merger. It may be that another crop of small plants will bob up after this merger. A number of steel executives seem certain to be footloose and it would not be difficult to raise capital in Detroit for an attractive steelmaking speculation.

There is automobile money in the Newton Steel Co., whose sheet mill at Monroe, Mich., is rapidly taking form; the Great Lakes Steel Corp., now building open-hearth steelmaking capacity and a strip mill just south of Detroit; and the Michigan Steel Corp. Powerful automobile interests are represented on the boards of Detroit's recent large bank merger.

* * *

IT IS noteworthy that no soft steel or alloy bar production is now accredited to the Detroit district and none seems in immediate contemplation. The Great Lakes, Newton, Michigan Steel and American Rolling Mill plants—provided the latter decides to utilize the 200 acres it has optioned at Wyandotte—provide sheet and strip capacity. Eastern interests are proposing a mill at Huron, O., and an important middle western company a finishing mill near Detroit, but in none of these projects do bars figure. It has been reported that the project for an alloy mill at Toledo, O., will be revived, but there seems no backing to this.

Bars, more than sheets, strip and other finished products, require greater production facilities and greater capital. A successful bar mill must roll a great number of sizes and shapes, else a division of business prejudicial to the smaller producer is inevitable. One of the largest steel accounts of the country, ranking with the A. O. Smith Corp., Milwaukee, requirements for plates, is predicated upon the bar needs of an automotive interest.

* * *

EQUIPMENT contracts for the Great Lakes Steel Corp. plant at Ecorse have largely been placed. Electrical equipment recently was divided between the Westinghouse and General Electric companies. The soaking pits as well as the open-hearth furnaces have been let to Alex Laughlin & Co. The Freyn Engineering Co. has the waste heat boilers. The rolling mills are now being constructed by the Mesta Machine Co. Foundations for the open-hearth furnaces have been completed and for the rolling mills are getting under way. Structural steel for the mill buildings will start going up in 60 days.

* * *

WITH Ford production at 180,000 to 200,000 units a month and the red ink of the early days of Model A growing paler, the promised $6 daily minimum wage for Henry Ford's employes comes closer to realization. The effect of the present $5 minimum is to make the daily average wage for all Ford employes about $7 and the maximum about $12. Presumably, a 20 per cent increase in the base rate would raise the average to $8.40 and the maximum to $14.40.

On the basis of the 5-day week, Ford employes are averaging 240 work days a year. Rarely does an employe stay at the minimum an entire year, but if he did his annual wage would be $1200. The present average wage is $1680 and the prospective one about $2000. The $7 daily average gives Ford employes $35 a week, compared with an average of $32.67 for the entire automotive industry.

Average hourly earnings in the automobile industry are inferior only to those in the printing industry, according to an investigation by the National Industrial Conference board, New York, which provides the following comparison:

Industry	Av. hours per week	Av. hourly earnings	Av. weekly earnings
Automobile	47.9	$0.688	$32.67
Iron and steel	54.3	0.646	35.13
Farm implement	49.9	0.625	31.16
Foundries	49.2	0.607	29.85
Machine tools	49.3	0.608	29.99
Hardware	47.5	0.542	25.72

* * *

FORD policy of paying workers in its foreign branches generous wages had aroused some comments upon the Fordizing of Europe. In France in particular has criticism been severe, one important newspaper claiming that the 27-cent per hour rate at the French Ford plant will mean "ruin and devastation. The exaggerated development of our industry would deprive agriculture of its few remaining workers. Other manufacturers will be compelled to follow suit, agriculture will be drained of its employes and the French race enfeebled," is the complaint.

An official close to Henry Ford observes that the minimum at the Ford plants in England is £1 daily, contrasted with the average £3 weekly at all English manufacturing establishments, and there has been no overturn in Britain.

* * *

THE forecast in this column Aug. 29 that a V-type 16-cylinder car would be placed on the market is borne out by an official statement by Cadillac. It will be January show time, at the earliest, before the new model is out. So far as is known, the present Cadillac and La Salle lines will be continued.

Hudson is generally understood to be working on a 8-cylinder car. It also is reported that Dodge will shortly be offering an 8.

A closely-guarded secret is that an important maker of low-priced cars will undertake the manufacture of springs. Steel for the new department has been placed and an official announcement is expected shortly. Another automobile manufacturer is considering the addition of a forging division.

There have been reports of close relations between Graham-Paige and Willys-Overland. Another rumor is that Willys-Overland will concentrate in Toledo many of the manufacturing operations on its Willys-Knight and Stearns-Knight models.

Southern Metal Trades Meets in October

Southern Metal Trades association, membership of which includes many of the leading foundries, machine shops and affiliated metal trades plants in the southern states from Virginia to Texas, will hold its annual convention at Knoxville, Tenn., Oct. 16 and 17, it is announced by William E. Dunn Jr., Georgia Savings Bank building, Atlanta, Ga., executive secretary. The principal business will be the election of officers for the coming year. The present officers include George B. Cocker, Gastonia, N. C., president; John S. Schofield, Macon, Ga., first vice president; William E. Dunn Jr., Atlanta, secretary, and W. G. Mealor, Gainesville, Ga., treasurer. Several addresses on topics of a technical nature relating to foundry and machine shop operation, will be made by men nationally known in this industry. The full program has not been completed.

Editorials

Metal Congress Idea Takes Well

ESTABLISHED but nine years ago, the American Society for Steel Treating has a record of achievement which would credit well an organization of greater age. The National Metal congress and exposition held in Cleveland last week was sponsored and organized by this society and constituted noteworthy contributions to the making, treating and fabrication of metals.

Five of the country's leading technical groups co-operated in the program of the congress, a program which brought together the largest group of metals experts ever to assemble. During five days more than 50,000 people visited the exposition displaying improved materials and equipment for a wide variety of purposes. Developments of new metals and processes are announced so rapidly that only by an interchange of information and first-hand observations can one remain well versed in his profession.

That technical papers and discussions serve a worthwhile purpose was proved thoroughly last week when every organization participating in the congress reported heavy attendance at sessions. The American Society for Steel Treating always has had unusually well attended meetings but all previous records were surpassed in Cleveland. A symposium on nitriding attracted 600 and no morning session drew less than 400.

Succeeding congresses and expositions probably will be fashioned after the 1929 accomplishment, with other technical groups participating as advantages of an annual metal week become established. And as long as the demand for technical knowledge remains at its present level, success will attend the undertakings.

1929 Is Banner Year for Earnings

DURING the present year little has been heard of "profitless prosperity," by which term business observers were fond of describing the state of industry of a short time ago. The reason for this is plainly written in the records of corporation earnings. Net profits in the first half of 1929 surpassed all previous levels and a new full-year record is in prospect.

Numerous compilations have been made revealing aggregate corporation earnings, but that of the National City Bank of New York, embracing the reports of 916 companies, is one of the most comprehensive. It shows that these corporations had an aggregate net of $2,449,907,000 in the first six months of 1929, compared with $1,924,264,000 in the corresponding period of 1928.

Of the great groups, manufacturing and trading companies reveal the best showing with a gain of 36.6 per cent over 1928. Railroads were next with a gain of 22 per cent, while utilities earnings increased about 18 per cent. Perhaps the most striking feature of the entire compilation is that showing a remarkable increase of 102 per cent for iron and steel companies and one of only 4 per cent for automobile producers.

While the production of motor cars this year has been phenomenal the increase in profits has been startlingly small, a reflection, unquestionably, of the excessively keen competition. At the same time it must be remembered that automobile company profits in 1928 were imposingly high. The iron and steel industry has benefited from a demand so large that capacities have been taxed, while prices, in the main, have been more satisfactory. Another important factor in better steel mill earnings has been in increased productive efficiency. On the whole, the exhibit of earnings for 1929 is one of the most encouraging developments for industry in recent years.

Better as Well as Bigger Hangars

AMERICAN Institute of Steel Construction made a notable contribution to the aesthetic side of the steel industry recently when it promoted a contest for improved designing of steel bridges. Now the opportunity offers for the interested organizations to take the initiative in bettering the designing of hangars.

Demand for housing all types of aircraft is certain to expand rapidly. The erection of hangars seems properly to fall within the purview of the construction rather than of the aircraft industry. Already a number of steel producers are active in furthering the use of their structural sections and sheets, especially for roofs and side walls.

It is patent that most hangars built to date have been designed more for utility than for beauty, and in so young an industry this is not unexpected. But shortly the airplane and dirigible will reach the popular stage, and hangars, both

public and private, will spring up in residential as well as outlying sections of most cities. Before the movement gets well under way the aesthetics of the situation should be considered.

For the same or only a trifling increase in outlay, hangars that do not affront the community can be designed. The regulation of the construction of hangars is as certain as that of garages in residential districts is now a fact. Those divisions of the steel industry which have a major market in hangars can render a genuine public service by setting up specifications which will take cognizance of the peculiar requirements of aircraft and yet combine art with utility.

Railroad Needs Are Promising

STEELWORKS officials find much of encouragement in consumptive prospects for railroads of the country in the next six months. Western carriers, particularly in recent years, have been urged to advance the start of their late-year rail purchasing programs, and at this season rail buying for next year apparently is getting a start of about 30 days.

Rail purchases for 1929 were between 2,250,000 and 2,500,000 tons. Fairly conservative estimates of steel producers, who have been surveying next year's railroad market, indicate the tonnage for 1930 at least should be more than 100,000 tons heavier. What plans are in store for new car building are less clearly defined now. The railroad programs being mapped out tend to offer something substantial ahead in prospective steel tonnage, according to measurements of consumption now at hand.

Ingot Decline Needs Interpretation

STEEL production in September, it is apparent, is at a lower rate than in August, and the fourth consecutive monthly decline in the daily ingot average is in process. In pig iron the identical situation obtains. Normally such decreases in production do not augur well, but there are special conditions which temper the obvious conclusion.

From May, when ingots set an all-time daily peak of 195,302 gross tons, to August, with a rate of 182,437 tons, the decline was only 7 per cent. The expectation is that September will come through with a rate of about 170,000 tons.

A year ago ingot production was rising. July, August, September and October developed steady advances. But the climax of this 4-month gain was only 172,221 tons daily in October. Each month of the third quarter this year will show a good margin over the same period of 1928, although production this year has been receding and last year it was rising.

The daily average for the third quarter of 1928 was 157,500 tons. For the first two months of the third quarter of 1929 the average was 184,100 tons, and conceding a further loss in September, the average will not fall much below 180,000 tons. It is assured that steel production this year will come up to the last quarter with a pronounced bulge over last year.

It may be that October will show a turnabout in the ingot rate. Provided the automobile manufacturers have their usual good October, and farm implement makers have a good fall run, and carbuilders have only normal business, demand might conceivably warrant higher operations. Against this, some far-sighted steel men are not so sure but that steel production is on a course which will taper slowly over the remainder of the year. But it should not be forgotten that September, the fourth consecutive backsliding month, will show a rate that approximates the all-time record prior to this spring's feverish activity.

Need Shapes for Super-highways

LARGE programs of highway and street construction being mapped out by municipalities to care for growing automobile traffic signify an uncharted consumption of structural steel material alone in the next two or three decades. Realizing that it is rapidly becoming impractical to consider seriously the widening on a large scale of present single level horse and buggy streets, several larger cities are looking to elevated super-highways.

Chicago has embarked upon a 20-year superhighway program, initial units of which will call for an expenditure of $110,000,000. A $20,000,000 bond issue for a part of the early requirements will be voted upon this fall. In recommending action upon three elevated highway propects for early completion, that city's plan commission, using figures since 1910 as a basis, estimates 900,000 automobiles will be using the streets in 1950, a gain of 82 per cent over the 495,000 of today. Other cities' estimates are showing similar increases.

Plans for express highways in various cities will have broad ramifications. New York is making a start with its west side elevated roadway. It is indicated such highways will give great impetus to the use of the automobile, and it is not unlikely, say traffic engineers, that the superhighways being planned now will have demands for their maximum capacities as rapidly as they can be completed.

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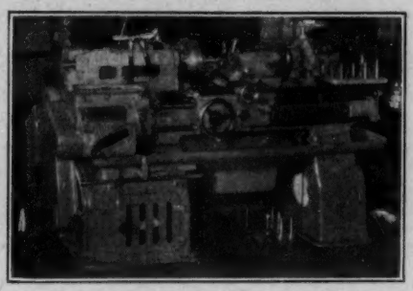

Machine Tool Show of 1927 To Be Eclipsed This Year. Page 712.

Featuring Machine Tool Show

MORE machine tools of new design will be displayed at the National Machine Tool Builders' exposition, in Cleveland, Sept. 30 to Oct. 4, than ever before seen in any similar show in this country, according to forecasts by exposition managers. There will be 260 separate displays, occupying 91,351 square feet of floor space. This issue of IRON TRADE REVIEW *gives readers a good idea of what they will see at the exposition. But before getting into these details some attention should be given to the leading article, to catch the real spirit and significance of the exposition. This indicates the tremendous, practical importance of machine tools in the economic life of the nation. Future expositions might well try to visualize and dramatize such facts; machine tools would win more popular appreciation.*

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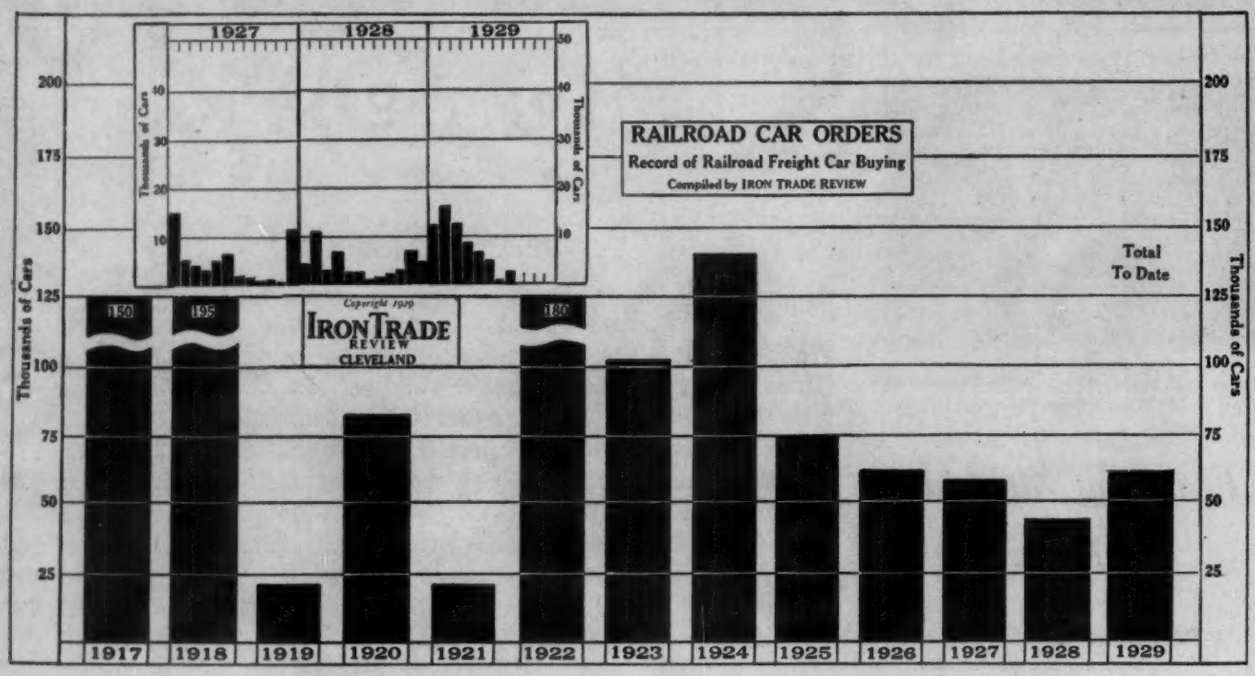
The Business Trend



Railroad Prosperity Continues

By JOHN W. HILL, Financial Editor

ONE of the important mainstays of the iron and steel industry this year has been greatly increased railroad buying. During the first six months the monthly records of freight car buying were uniformly higher than for the corresponding periods of the preceding year. In July the volume of orders dropped off to a mere handful, but August brought a prompt and impressive recovery.

FOR that month the aggregate of freight car awards was 2854, compared with 677 in August, 1928, and the highest for any August in recent years. The figures for the month brought the total for eight months to 66,011 cars, compared with 29,593 in the first eight months of 1928, 45,641 in 1927 and 45,385 in 1926.

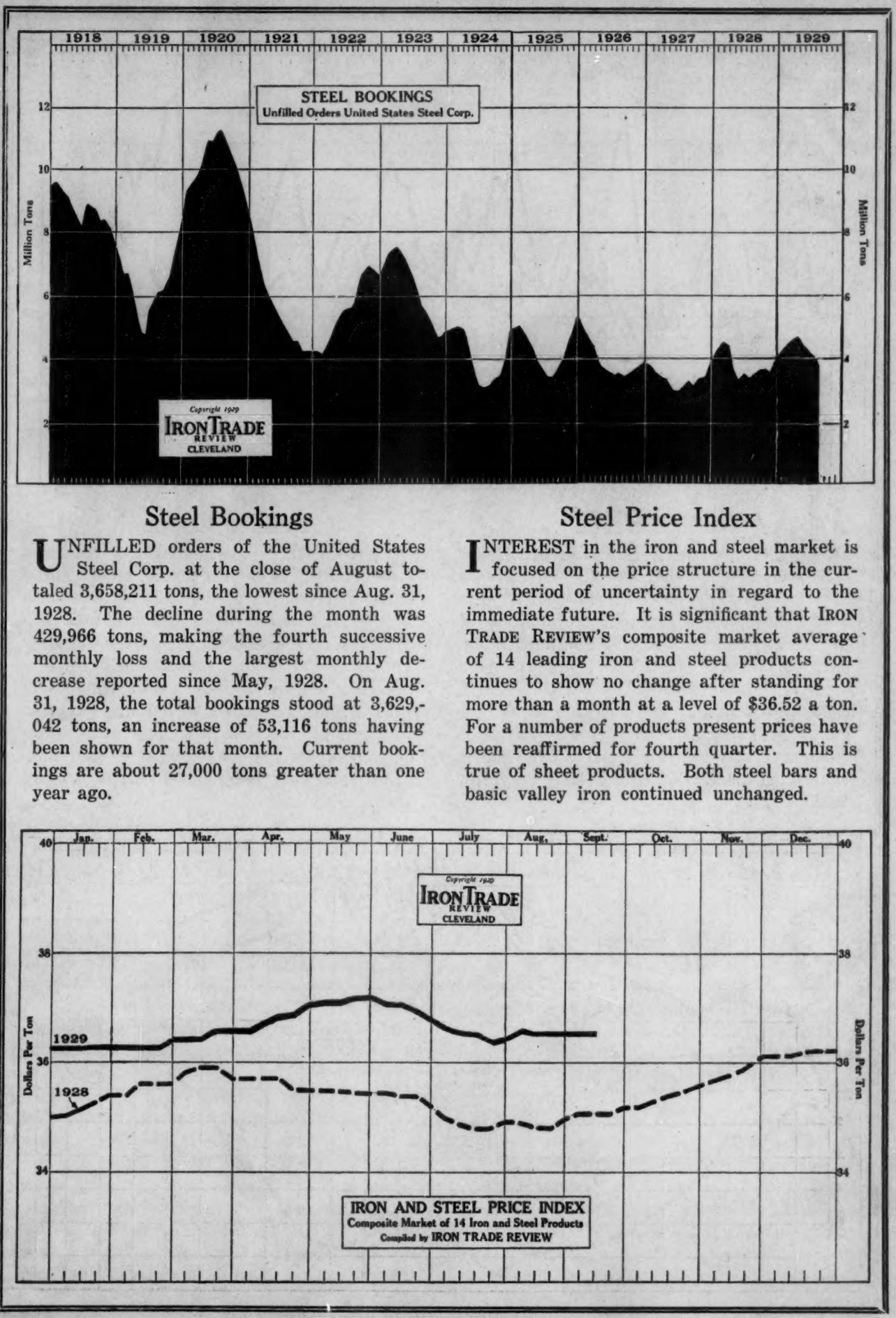
THE purchase of new equipment is likely to continue at a better rate for some time. Not only are traffic volumes larger this year than ever before, but the roads are beginning to reap the benefits of their long efficiency program. Current railroad traffic is making new high records and for the year to the close of August the volume of revenue freight cars loaded was 35,334,977, against 33,754,221 cars in 1928.

RAILROAD income this year has exceeded all previous years, due to more traffic and the ability to hold down expenses. Although the aggregate income of the roads has increased by about 7 per cent the net income has increased by more than 20 per cent compared with 1928. Meanwhile, the heavy traffic is creating great wear and tear upon rolling stock, so that replacements are a logical development.

AN EXAMPLE of the effect of current traffic upon equipment is found in the recent report of locomotives in need of repair, showing an increase of 512 compared with one year ago. The number needing repairs represents 14.3 per cent of the total against 13.4 per cent one year ago.

THE outlook for the remainder of the year continues to prove rather uncertain. So far there have been no signs of any fundamental weakening of the general situation, the present lull in some lines being interpreted as reflecting delayed seasonal influences. At the present time there are no certain evidences that October will bring the expected pickup in automobile production. Meanwhile general conditions are holding above this time one year ago.

The Business Trend



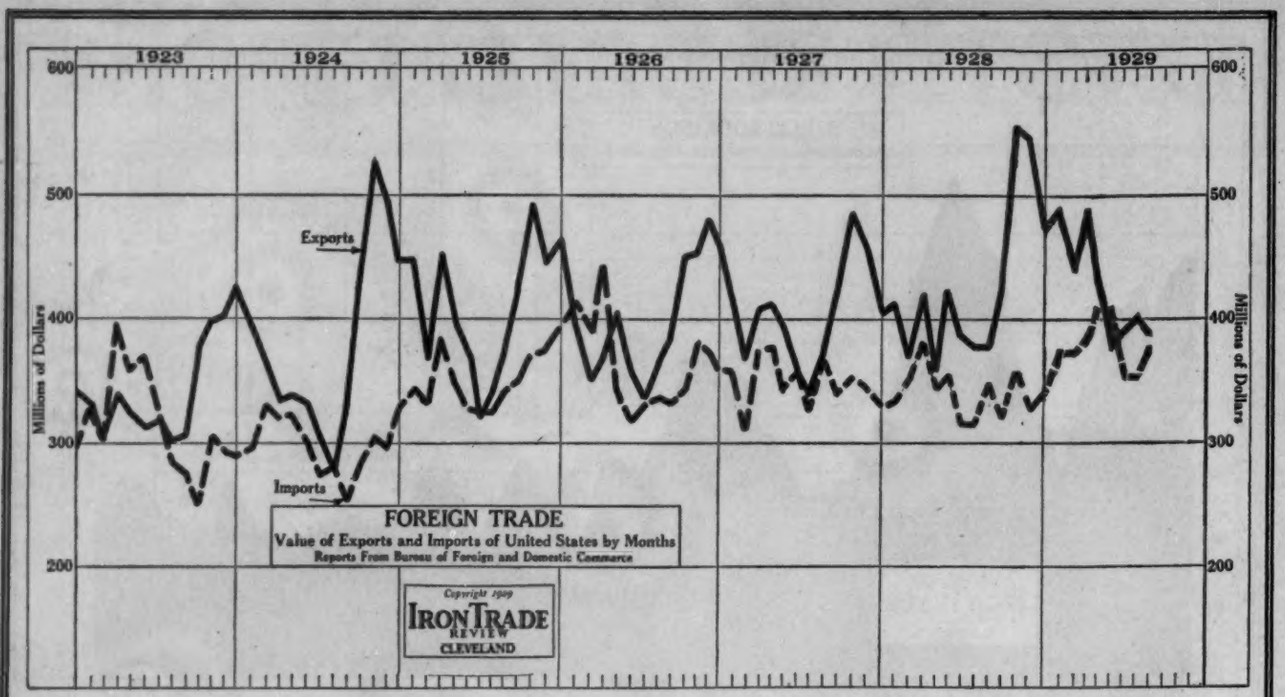
Steel Bookings

UNFILLED orders of the United States Steel Corp. at the close of August totaled 3,658,211 tons, the lowest since Aug. 31, 1928. The decline during the month was 429,966 tons, making the fourth successive monthly loss and the largest monthly decrease reported since May, 1928. On Aug. 31, 1928, the total bookings stood at 3,629,042 tons, an increase of 53,116 tons having been shown for that month. Current bookings are about 27,000 tons greater than one year ago.

Steel Price Index

INTEREST in the iron and steel market is focused on the price structure in the current period of uncertainty in regard to the immediate future. It is significant that IRON TRADE REVIEW'S composite market average of 14 leading iron and steel products continues to show no change after standing for more than a month at a level of $36.52 a ton. For a number of products present prices have been reaffirmed for fourth quarter. This is true of sheet products. Both steel bars and basic valley iron continued unchanged.

The Business Trend

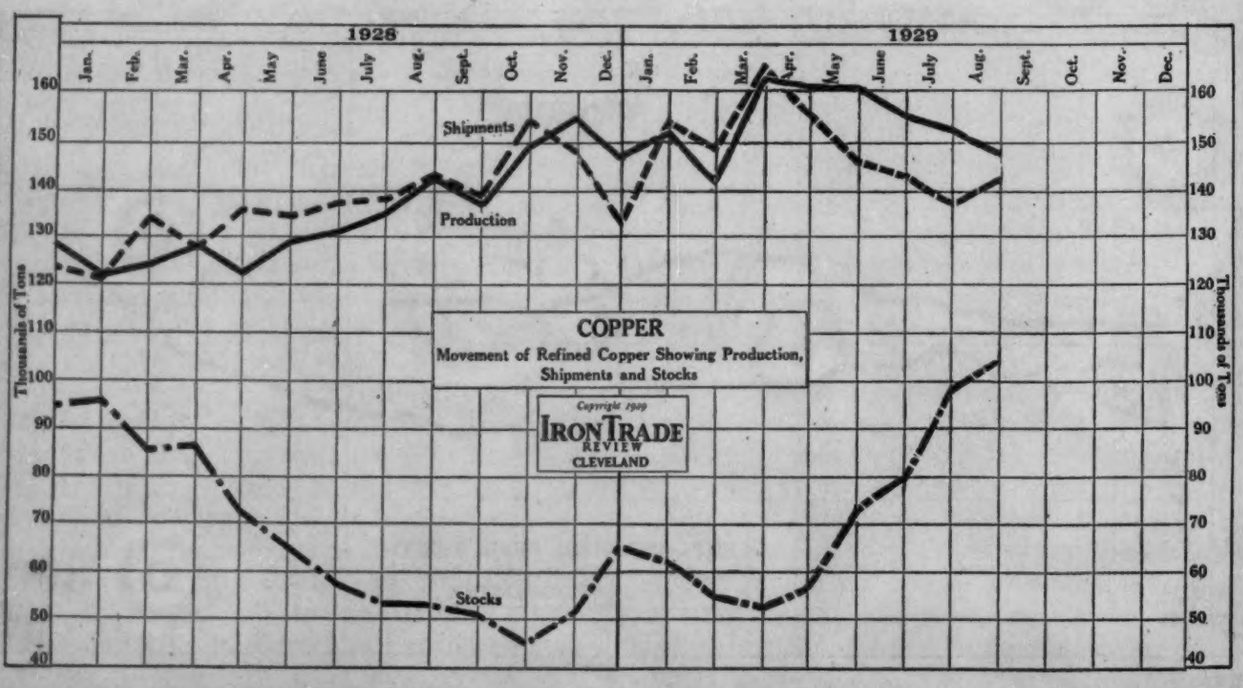


Foreign Trade

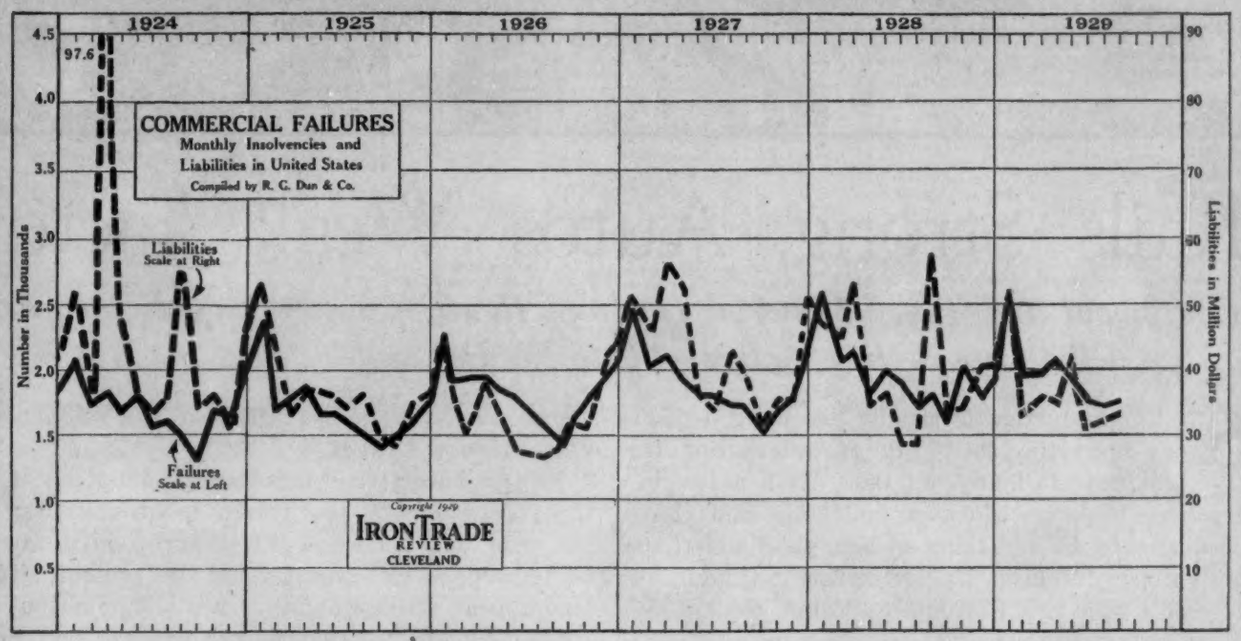
AUGUST brought a decline in exports of American merchandise and an increase of imports. Exports for the month were $382,000,000, compared with a valuation of $401,000,000 during the preceding month and $379,006,000 in August, 1928. Imports stood at $377,000,000 in August, compared with $353,000,000 in July and $346,700,000 in August, 1928. For the first eight months of 1929 exports were valued at $3,407,875,000, against $3,135,979,000 in the same period of 1928.

Refined Copper

ALTHOUGH August brought a reduction in output of refined copper, stocks in the hands of producers at the close of the month showed another increase. The total was 104,372 tons, compared with 97,729 tons in July. This was the largest tonnage held by producers since July, 1927. Shipments were 142,005 tons, compared with 138,924 tons in July and 143,638 tons in August, 1928. Production of 148,648 tons compared with 153,513 tons in July and 143,560 tons in August, 1928.



The Business Trend

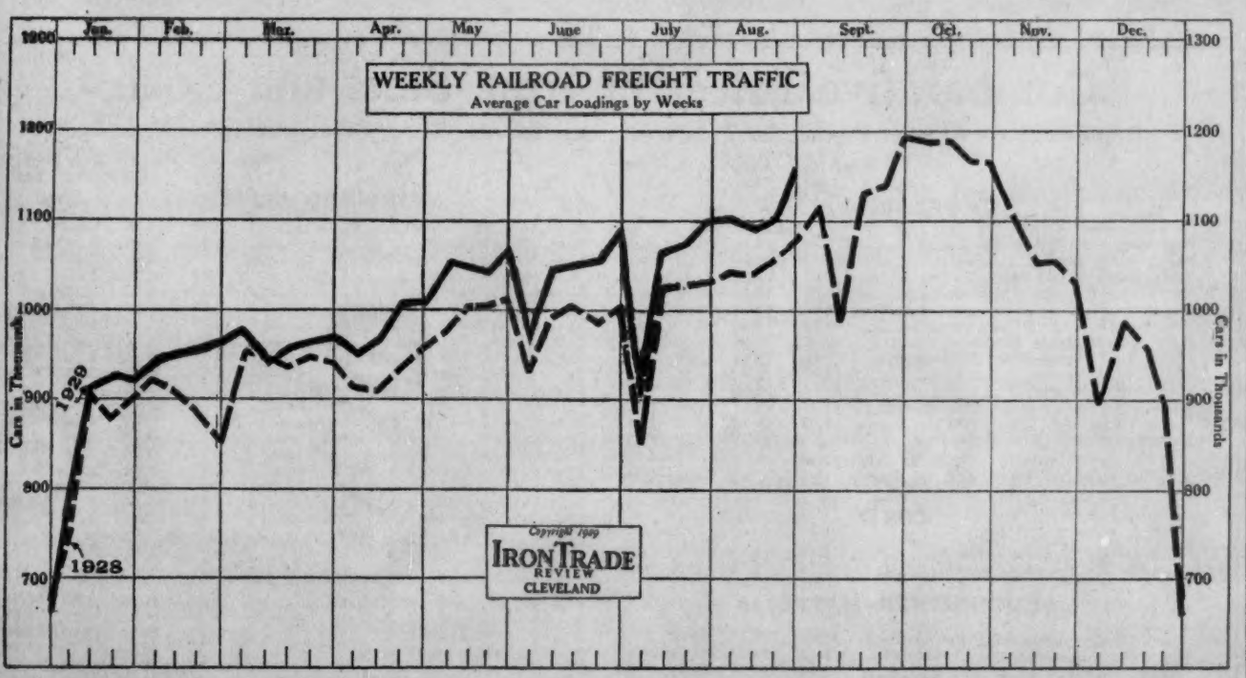


Commercial Failures

DURING the last few months there has been little variation in the number of commercial failures in the United States. In August 1762 insolvencies were reported by R. G. Dun & Co., compared with 1752 in July and 1767 in June. The number of failures in August compared with 1853 in that month one year ago. Liabilities in August of $33,746,452 compared with $32,425,519 in July and $58,201,830 in August, 1928. For the first eight months of the year the number of failures was 4 per cent below one year ago.

Weekly Rail Traffic

LOADINGS of revenue freight soared to a new high peak during the last week of August. Freight movements for the period ended Aug. 31 amounted to 1,160,210 cars, an increase of 24,643 cars compared with a total of 1,129,533 cars in the preceding week. Compared with the corresponding period of 1928, loadings in the closing week of the month represent an increase of 43,499 cars. For the calendar year to date freight loadings amount to 35,334,977 cars, compared with 33,554,221 cars in 1928.



Rails Strong, Autos Weak Factor

Equipment and Track Material Demand Heavy—Motor Output Curtailed —Pig Iron Selling Active—Plate Needs Large—Prices Steady

STEEL production is rapidly becoming dependent upon the daily run of orders, for the first time in many months. With a few exceptions, backlogs of sheet and strip mills have been worked off and those of bar, plate and shape mills sharply reduced. Operating rates, while in excess of a year ago, continue to decline moderately.

Will Carriers Neutralize Auto Industry?

In some lines an upturn in October still is looked for, but the comeback may not be general. Railroad inquiry for and buying of equipment and track material is brisk. The building, farm implement and general manufacturing lines are at least as active as a year ago and are above what might be considered normal.

But the automotive industry, largest single consumer of steel, is apathetic. Ford and Chevrolet, accounting for 55 per cent of all production, have lighter schedules, due partially to coming model changes. Shrinking specifications for steel from these interests are not offset by expansion of operations of smaller makers. Detroit is convinced that the best months of the automobile year are now behind it.

In the automotive industry as in steel, it is the contrast with the record months earlier in the year and not with last year or what might be termed normal that makes the present situation appear unsatisfactory. September output in both industries is expected to surpass last September's, but the general trend in the remaining months of the year is conceded to be downward.

Corporation Rate Down 3 Points

Paradoxically, the Pittsburgh and Youngstown districts, where automotive business is predominant, have surrendered less ground in production than the Chicago district, but in the latter territory hopes for an upswing next month are highest. Most districts have receded several points in the past week, Chicago mills being at 88 per cent, Pittsburgh 90, Buffalo 80 and Youngstown 85. Steel corporation subsidiaries are at 88 per cent, independents 81 and the industry 84½.

Being assured of prompt deliveries and no

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Sept. 18, 1929	Aug. 1929	June 1929	Sept. 1928
PIG IRON				
Bessemer, del. Pittsburgh	$20.76	20.76	20.76	18.86
Basic, valley	18.50	18.50	18.50	16.10
Basic, eastern, del. eastern Pa.	19.85	19.85	20.25	19.00
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	18.61
No. 2 foundry, Chicago	20.00	20.00	20.00	18.25
*Southern No. 2, Birmingham	14.00	14.00	15.25	16.25
**No. 2X, Virginia furnace	20.00	20.00	20.00	20.50
**No. 2X, Eastern del. Philadelphia	22.26	22.26	22.76	21.01
Malleable, valley	19.00	19.00	19.00	17.10
Malleable, Chicago	20.00	20.00	20.00	18.25
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
†Gray forge, del. Pittsburgh	19.13	19.13	19.13	18.01
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	109.79

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.
†Now based on Pitts. dist. fur. price; formerly on Valley base.

COKE				
Connellsville furnace, ovens	2.65	2.75	2.75	2.75
Connellsville, foundry, ovens	3.75	3.75	3.75	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	35.00	35.00	35.75	33.00
Sheet bars, open-hearth, Pittsburgh	35.00	35.00	35.75	33.00
Billets, open-hearth, Pittsburgh	35.00	35.00	35.75	32.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.00

	Sept. 18, 1929	Aug. 1929	June 1929	Sept. 1928
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.95	1.95	1.95	1.90
Steel bars, Chicago	2.05	2.05	2.05	2.00
Steel bars, Philadelphia	2.27	2.27	2.27	2.22
Iron bars, Chicago	2.05	2.05	2.05	2.00
Shapes, Pittsburgh	1.95	1.95	1.95	1.90
Shapes, Philadelphia	2.06	2.06	2.06	2.06
Shapes, Chicago	2.05	2.05	2.05	2.00
Tank plates, Pittsburgh	1.95	1.95	1.95	1.90
Tank plates, Philadelphia	2.15	2.15	2.15	2.10
Tank plates, Chicago	2.05	2.05	2.05	2.00
Sheets, black, No. 24, Pittsburgh	2.85	2.85	2.95	2.65
*Sheets, blue anl., No. 13, Pittsburgh	2.35	2.35	2.35	2.00
Sheets, gal., No. 24, Pittsburgh	3.50	3.55	3.65	3.50
Sheets, black, No. 24, Chicago	3.10	3.10	3.10	2.85
*Sheets, blue anl., No. 13, Chicago	2.50	2.50	2.50	2.15
Sheets, galvanized, No. 24, Chicago	3.75	3.80	3.85	3.65
Plain wire, Pittsburgh	2.40	2.50	2.50	2.40
Wire nails, Pittsburgh	2.55	2.60	2.65	2.55
Tin plate, per base box, Pittsburgh	5.35	5.35	5.35	5.25

*Comparisons for June, 1929 and September, 1928, are with old blue annealed base, No. 10.

SCRAP				
Heavy melting steel, Pittsburgh	18.25	18.90	18.30	16.55
Heavy melting steel, eastern Pa.	16.50	16.75	16.25	14.65
Heavy melting steel, Chicago	15.00	15.00	14.25	12.90
No. 1 wrought, eastern Pa.	16.25	16.25	16.25	15.10
No. 1 wrought, Chicago	15.75	15.50	15.40	12.90
Rails for rolling, Chicago	17.50	17.75	17.50	15.80

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND

STEEL PLATES

Pittsburgh, base	1.95c
Philadelphia, del.	2.15c to 2.25c
New York, del.	2.225c to 2.325c
Boston, del.	2.265c to 2.415c
Chicago, base	2.05c to 2.15c
Cleveland, delivered	2.14c
Lackawanna, N. Y., base	2.05c to 2.15c
Birmingham, base	2.10c
Coatesville, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
St. Louis, del.	2.27c
Detroit, del.	2.19c to 2.24c

STRUCTURAL SHAPES

Pittsburgh, base	1.95c
Philadelphia, del.	1.96c to 2.11c
New York, del.	2.195c to 2.245c
Boston, del.	2.265c to 2.415c
Chicago, base	2.05c to 2.15c
Cleveland, delivered	2.09c to 2.14c
Lackawanna, N. Y.	2.05c to 2.15c
Birmingham, base	2.10c
Bethlehem, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	2.19c to 2.24c

BARS

SOFT STEEL

Pittsburgh, base	1.95c
Chicago, base	2.05c to 2.15c
Birmingham, base	2.10c
Lackawanna, N. Y., base	2.05c to 2.15c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.90c to 1.95c
Cleveland, del., outside mills	1.95c
Philadelphia, del.	2.27c to 2.32c
New York, delivered	2.29c to 2.34c
Boston, delivered	2.265c to 2.415c
Detroit, del.	2.19c to 2.24c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.95c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	2.05c to 2.10c
New York, delivered	2.19c to 2.24c
Philadelphia, delivered	2.17c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet, cut lengths	2.30c
Stock lengths from mill	2.05c
Chicago, billet	2.35c to 2.85c
Chicago, rail steel	1.95c to 2.05c
Chicago, rail steel, road and bridge work	1.95c to 2.05c
Philadelphia, cut lengths	2.57c to 2.62c

SHEETS

SHEET MILL BLACK, NO. 24

Pittsburgh, base	2.85c
Philadelphia, delivered	3.17c to 3.27c
Gary, Indiana Harbor	3.05c
Chicago, delivered	3.10c
Birmingham, base	3.10c
St. Louis, del.	3.27c

TIN MILL BLACK, NO. 28

Pittsburgh, base	3.00c
Gary, base	3.10c

GALVANIZED, NO. 24

Pittsburgh, base	3.50c to 3.60c
Philadelphia, delivered	3.82c to 3.92c
Gary, Indiana Harbor	3.70c to 3.75c
Chicago, delivered	3.75c to 3.80c
Birmingham, base	3.75c
St. Louis, del.	3.92c

BLUE ANNEALED

Sheets, No. 13

Pittsburgh, base	2.35c
Chicago district mills	2.45c
Chicago, delivered	2.50c
St. Louis, delivered	2.67c
Philadelphia, delivered	2.67c
Birmingham	2.50c

Plates, No. 9 and 10

Pittsburgh, base	2.10c to 2.20c
Chicago district mills	2.30c
Chicago, delivered	2.35c
Philadelphia, delivered	2.52c
St. Louis, delivered	2.67c
Birmingham	2.35c

AUTOMOBILE, NO. 20

Pittsburgh, base	4.10c
Detroit, delivered	4.39c

FURNITURE

Pittsburgh	4.20c

(Turn to the following page)

advance in price, steel consumers are slow, especially in the Middle West, to close for the fourth quarter. Relatively more pig iron than finished steel has been contracted for. In pig iron the price situation seems firmer as extreme low southern prices are withdrawn. Steel prices are unchanged, with some softness apparent in hot strip.

For the 2000 freight cars which the Southern and Norfolk & Western railroads each are inquiring 27,000 tons of steel, chiefly plates, will be required. Repairs to 1000 hoppers placed by the Norfolk & Western call for 6500 tons. The Chicago, Milwaukee, St. Paul & Pacific's order for 1000 cars involves 15,000 to 20,000 tons. The Santa Fe is expected to buy 5854 cars, requiring over 60,000 tons of steel. The Central of Georgia has ordered 550 cars, the Great Northern will build 300 ore cars in its own shops, while the Chicago & Eastern Illinois will rebuild 500. All told, about 10,600 cars requiring over 100,000 tons of steel are on inquiry.

Pittsburgh Sees Better Bar Demand

One western railroad has closed on 50,000 tons of rails and 12,000 tons of fastenings, for 1930 delivery. Other western inquiry, expected shortly, will approximate 100,000 tons of rails, with commensurate fastenings. The Pennsylvania is taking bids on 8000 kegs of spikes, and the Chesapeake & Ohio on 10,000 tons of tie plates. Both Chicago and Pittsburgh report slight improvement in soft steel bar demand, but in other lines demand still is shrinking gently. Pittsburgh district barmakers believe the bottom of the dip has been passed. Of the 18,000 tons of southwestern tank inquiry at Chicago, 6500 tons went to eastern and southern mills. A New York water line calls for 4000 tons of plates. Fresh tank inquiry from west Texas totals 5000 tons. At Chicago 12,000 tons of structural work has been closed, including 5000 tons for Great Northern railroad bridges.

Sheet, Strip Backlogs Dwindle

New York reports better buying of sheets and Chicago still encounters excess demand for the blue annealed grade, but otherwise sheet requirements are lighter. Mill operations have not been reduced as rapidly as orders, and backlogs of most makers have practically disappeared. Strip orders are light, and the price structure in the Middle West is not strong. Cold finished requirements still reflect automotive inertia. Wire mills are holding their ground.

Despite heavy selling for the fourth quarter, pig iron continues in an active market. The lake furnaces have sold 75 per cent of their last quarter output. Southern furnaces have sold over 200,000 tons in St. Louis territory recently. Some heavy but quiet covering is reported in the Pittsburgh-Youngstown-Cleveland districts.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (September 18, 1929)	$36.52
Last week (September 11, 1929)	36.52
One month ago (August, 1929)	36.54
Three months ago (June, 1929)	36.99
One year ago (September, 1928)	35.19
Ten years ago (September, 1919)	48.35
Fifteen years ago (September, 1914)	23.17

For the sixth consecutive week the IRON TRADE REVIEW composite of 14 leading iron and steel products is unchanged at $36.52. The average for August was $36.54, July, $36.71 and last September, $35.19.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted On Last Editorial Page—See Preceding Page For Other Products

HOOPS, BANDS, STRIPS

Hot strips, to 6-in., Pitts.	2.00c
Hot strip 6 1/8 to 24-in., Pitts.	1.90c
Hot strip, bands 6 in. and under, Chicago	2.10c to 2.20c
Do, 6 1/8 to 23 1/8	2.00c
Cooperage stock, Pittsburgh	2.20c
Do, Chicago	2.30c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 ton and over)	2.75c to 2.85c
Worcester, Mass. (3 tons and over)	2.90c to 3.00c

ALLOY STEEL

Hot Rolled
F.o.b. Mills
Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differential	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanadium	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds, squares)	0.50	3.15

Hot rolled alloy billets 4 x 4-inch and over take same price per gross ton as same specification alloys bars per net ton. Sizes under 4 x 4 to 2½ in. x 2½ in. inclusive sold on bar basis plus steel bar card extras for size. Sizes under 2½ in. x 2½ in. take bar price on net ton basis.

COLD FINISHED STEEL

Cold finished steel bars drawn or rolled, Pitts., Chi., c.l.	2.30c
Do, del. Detroit	2.575c
Shafting (turned, polished) Pittsburgh	2.30c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.65c to 3.10c
Cold finished steel bars, Cleve.	2.35c

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland, Ironton base
(Per Pound)
Bright plain wire, 6 to 9 gage 2.40c to 2.50c

	Dealer Trade	Large Jobbers
Annealed field wire	2.65c	2.55c
Galvanized wire	3.10c	3.00c
Barbed wire, galvanized	3.30c	3.20c
(Per 100-pound keg)		
Wire nails	$2.65	$2.55
Galvanized nails	4.65	4.55
Polished staples	3.10	3.00
Galvanized staples	3.35	3.25
Cement coated nails	2.65	2.55
Manuf. wire, del. Detroit		2.635c
Wire nails, del. Detroit		$2.785

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland-Ironton base on products made there; Duluth $2 higher; Worcester, Mass., Fairfield, Ala., $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

Anderson, Ind., $1 higher, Chicago $2 higher, Duluth, Birmingham $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails, l.c.l., f.o.b. mills	2.70c to 2.75c
Cut nails, l.c.l. f.o.b. mills	2.80c to 2.85c
Sheet piling, base, Pittsburgh	2.25c
Chain proof BB and BBB, Pitts.	
3/16-in. to ½-in.	33 1/3 and 5 off
9/16-in. to 1¼-in.	33 1/3 off

CAST IRON WATER PIPE

Class B Pipe—Per Net Ton

Six-inch and over, Birming'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Six-inch and over, New York	37.50 to 39.50
Four-inch, New York	40.00 to 41.00
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN PLATE TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.35

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.00c to 4.10c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, c.l., Chicago dist.	$6.702 to 26.90 off
Lock: to dealers	85-5 off
Lock: to consumers	85 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 29.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	$43.00

BOLTS AND NUTS

Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.

Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread ..... 60 to 70 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Eagle list ..... 60 to 70 off

MACHINE BOLTS

All sizes, cut thread ..... 60 to 70 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Lag screws	60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads	60 to 70 off
Tap bolts	60 to 70 off
Blank bolts	60 to 70 off
Stud bolts without nuts	60 to 70 off

Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 10, 10 and 5 with 2½ off in bulk.

Tire bolts	60-5 off

Nuts

Semifinished	60 to 70 off

HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	5 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

RIVETS

Struc., c.l., Pitts.-Cleve.	3.10c
Structural, c.l. Chicago	3.20c
**7/16-inch and smaller, Pitts.	70 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED STEEL

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$35.00
Pittsburgh, bessemer	35.00
Youngstown	35.00
Cleveland	35.00
Philadelphia	40.30
Chicago	37.00
Forging, Chicago	42.00
Forging, Pittsburgh	40.00 to 41.00
Forging, Philadelphia	45.30

SHEET BARS

Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00
Chicago	37.00

SLABS

Pitts., Young.	$35.00
Cleveland	35.00

WIRE RODS

Pittsburgh, Cleveland	$42.00
Chicago	43.00

SKELP

All grades, Pittsburgh	1.90c

IRON ORE

LAKE SUPERIOR ORE

Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%	$4.80
Mesabi bessemer, 51½%	4.65
Old range nonbessemer, 51½%	4.65
Mesabi nonbessemer, 51½%	4.50
High phosphorus, 51½%	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%	8.00
Copper-free low phos. 58-65%	nominal

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese	11.00 to 11.50
North African low phosphorus	12.00 to 12.50
Swedish foundry or basic, 65%, nominal at	9.00 to 10.00
Spanish and North African basic, 50 to 60 per cent	11.50 to 12.00
Newfoundland foundry, 55%	nominal
Tungsten future, short ton unit, duty paid	15.75 to 16.00
Chrome, 48-50%, c.i.f. long ton	24.00 to 25.00

MANGANESE ORE

Prices, not including duty, are cents per unit.

Brazilian	34 to 36 cents
Indian	34 to 36 cents
Caucasian, (53-55 per cent)	36 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide., gross ton	$21.00

REFRACTORIES

FIRE CLAY BRICK

Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE

Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	40.00

CHROME BRICK

Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	45.00

Pig Iron

Markets Fairly Active—Shipments Holding Up—Southern Furnaces Place 200,000 Tons in St. Louis District

NORTHERN blast furnace interests report experiencing one of the longest periods of sustained activity in their history, reflected in the weekly volume of sales. Shipments average close to the August rate, and in a number of instances exceed it. While lake furnaces have booked orders for close to 75 per cent of their output for fourth quarter, considerable iron remains to be placed for that period in other districts. Southern furnaces have sold 200,000 to 225,000 tons of pig iron in the St. Louis district in recent weeks, due to low price offerings. One maker long inactive in the St. Louis territory booked 85,000 tons, mainly basic. Despite this invasion of northern markets, all available merchant stacks in the Chicago district will be active in ten days to build up stocks.

PITTSBURGH, Sept. 17.—Sales of pig iron are fairly active, although most of the fourth quarter tonnage remains to be placed. Current business for some sellers shows an improvement over August. A number of melters are placing orders only as iron is needed, although sales in the past week show a fair sprinkling of 500 and 1000-ton lots for shipment over the remainder of the year. Few large inquiries are pending, including one of 5000 tons for a Uniontown, Pa. user. The largest consumer of foundry iron in this district is not expected in the market for several weeks. There is no occasion to change prices on the basis of last sales. Concessions are reported on malleable, but recent lots were placed recently at $19, valley. Basic still is nominal at $18.50.

Boston, Sept. 17.—Pig iron prices are firmer, with the general run of orders taken by Buffalo furnaces at $18.50 to $19, base, Buffalo. Mystic Iron Works continues to receive $20, furnace. Alabama iron also is slightly firmer. About 3000 tons was sold in the past week, of which Mystic booked one-third.

New York, Sept. 17.—Pig iron sellers here report a moderate business, with one selling 5400 tons. A Bridgeport, Conn, melter is understood to have closed for several thousand tons of basic. Prices check back to $17.50 to $18, base, Buffalo. Southern iron appears stronger, although $19 to $19.50, delivered New York docks, still prevail. Foran Foundry & Mfg. Co., Flemington, N. J., is inquiring for 500 tons of foundry iron.

Buffalo, Sept. 17.—District sales of pig iron the past week total 15,000 to 20,000 tons. More than 10,000 tons of inquiry is pending, mainly in the East. Buffalo furnaces say eastern prices are firmer with $18, furnace, the lowest. District bases are unchanged and firm.

Youngstown, O., Sept. 17.—While new buying of pig iron continues desultory, shipments are declared satisfactory. The principal local producer of basic iron says he will not be able to work out from under present bookings until well through October or later. No. 2 foundry and basic hold at $18.50, valley furnace, while bessemer and malleable bring $19.

Cleveland, Sept. 17.—Sales of pig iron by Cleveland furnace interests increased during the past week to 23,600 tons, approximately 4000 tons more than in the week preceding. The continuous run of good business has given makers good backlogs for fourth quarter, while one Cleveland furnace with steelworks connections is entirely out of the market for the remainder of the year. Others are booked for 60 to 75 per cent of their output for that period. Shipments are larger than the corresponding rate in August, leading merchant furnace interests report. Inquiry is strong, and indicates a well sustained volume of business. Prices are firm at $18.50, base, furnace, for shipment from a Cleveland producer to outside districts, and $19, base, for local delivery.

Detroit, Sept. 17.—Automotive foundries are not melting as much iron as a month ago, but this loss has about been neutralized by slight improvement at stove and radiator plants. Pig iron shipments thus far in September have fallen only a little short of the first half of August. Fair buying for fourth quarter has been done, but most users covered for the half. Neither producers nor consumers have stocks. Malleable and No. 2 foundry iron are $20, Detroit.

Chicago, Sept. 17.—Operation of the third available Iroquois merchant furnace at South Chicago will be resumed in about ten days. This will give northern interests all six available merchant stacks for Chicago district production. Furnace stocks have been drained by heavy shipments in recent weeks, and efforts are to be made for a better balance of grades to meet increased shipping demands. Several additional orders have been closed for the remainder of the year. The northern price of $20, Chicago furnace, for the base grades is reported firm.

Only 25 per cent of fourth quarter merchant production in this district remains to be placed under contract, according to estimates. Sales during the past week were among the heaviest weekly totals this year. Deliveries are at the August rate.

St. Louis, Sept. 17.—The recent large buying movement of pig iron in this district has subsided. The bulk of iron needed for the fourth quarter has been contracted for. The aggressive invasion of southern producers with sharp price cuts resulted in their selling in this territory a total estimated at 200,000 to 225,000 tons. One southern blast furnace interest, which had not figured in the selling to any

(Concluded on Page 760)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$19.00
Bessemer, del. Pittsburgh	20.76
Basic, valley furnace	18.50
Basic, Pitts, dist. fur.	19.00
*Basic, del. Pittsburgh	19.63 to 20.13
Basic, Buffalo furnace	18.50
Basic, del. eastern Pa.	19.85 to 20.76
Malleable, valley furnace	19.00
Malleable, Pitts, dist. fur.	19.50
*Malleable, del. Pittsburgh	20.13 to 20.63
Malleable, Cleve. fur. for local del.	19.00
Malleable, Chicago furnace	20.00
Malleable, Buffalo furnace	20.00
Malleable, del. eastern Pa.	21.76 to 22.90
Malleable, Granite City fur.	20.00
No. 1 foundry, Chicago furnace	20.50
No. 1X, Eastern del., Phila.	22.76
No. 1X, Buffalo furnace	21.00
No. 2 foundry, valley furnace	18.50
No. 2 fdy., Pitts. dist. fur.	19.00
*No. 2 foundry, del. Pittsburgh	18.63 to 20.13
No. 2 plain, Buffalo furnace	19.50
No. 2 foundry, Chicago furnace	20.00
No. 2 fdy. Cleve, fur. for local del.	19.00
No. 2 fdy., Granite City	19.50 to 20.00
No. 2 plain, del., Phila	21.76
No. 2 plain, Virginia furnace	19.50
No. 2 plain, Buffalo, del. Boston	21.91
No. 2 plain, N. J., tidewater	20.78 to 21.78
No. 2 Alabama, Bir. base	14.00 to 14.50
No. 2 Tenn., Birmingham base	14.00 to 14.50
No. 2 Tenn., del. Cincinnati	17.19 to 18.19
No. 2 Alabama, del. Cincinnati	17.19 to 18.19
No. 2 Alabama, del., Cleveland	20.51 to 21.01
No. 2 Alabama, del. Chicago	19.01 to 20.01
No. 2 Alamaba, del. St. Louis	17.42 to 17.92
No. 2 Ala., Phila., dock dely.	18.75 to 19.75
No. 2 Ala., Balt., dock dely.	18.50 to 19.25
No. 2 Ala., N. Y. dock dely	19.00 to 19.50
No. 2 Ala., Boston, dock dely.	20.75
No. 2X, east, N. J., tidewater	21.28 to 22.28
No. 2X, eastern, del. Phila.	22.26
No. 2X, foundry, Buffalo furnace	20.00
No. 2X, Buffalo, del. Boston	22.28 to 22.78
No. 2X, Virginia furnace	19.50 to 20.00
Gray forge, Pitts. dist. fur	18.50
*Gray forge, del. Pittsburgh	19.13 to 19.63
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.76
Low phos., copper bearing fur.	23.00 to 24.00
Charcoal, Superior, del., Chicago	27.04

*Freight from Pittsburgh district furnace to points in Pittsburgh district 63c, 76c and $1.13 per ton.

CANADIAN PRICES

No. 1 foundry, del. Toronto	$24.60
No. 1 foundry, del. Montreal	26.00
No. 2 foundry, del. Toronto	24.10
No. 2 foundry, del. Montreal	25.50
Malleable, del. Toronto	24.60
Malleable, del. Montreal	26.00
Basic, del. Montreal	24.50

Silvery iron Jackson county, O., furnaces in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$41; 16—$43.50; 17—$46.50.

The Market Section

Coke

Beehive Merchant Production Still Low—Furnace Contracts Closed at Unchanged Prices

DEMAND for furnace and foundry coke is quieter. A number of furnace interests have covered requirements for beehive fuel over the remainder of the year at prices unchanged from present levels. Spot business is light, and prices range from $2.65 to $2.75. Foundries generally have reduced receipts of beehive and by-product coke shipments.

Pittsburgh, Sept. 17.—Activity in the spot beehive furnace coke market still is restricted, but some tonnages have been closed for fourth quarter. Two consumers in this and nearby districts placed requirements for that period, and while the prices were not disclosed it is understood there was no change from previous contracts. A number of old contracts extend through the remainder of the year, so that additional forward buying is expected to be limited. Sellers generally are holding spot tonnage at $2.75, with occasional lots going at $2.65. Shipments on old orders are fairly steady. Foundry coke demand still is light, and prices are unchanged. Output of merchant ovens continues at the lowest point of the year, with blast furnace ovens slightly more active.

Production of coke in the Connellsville region for the week ended Sept. 7 was 82,990 tons, compared with 80,600 tons the preceding week, according to the *Connellsville Courier*.

Boston, Sept. 17.—Domestic coke is in heavy demand and foundry coke shipments are holding up somewhat better than expected. Prices are steady.

New York, Sept. 17.—Coke buying continues slack, with contract specifications in some cases falling behind schedule. The foundry coke market, however, is unchanged at $3.75 to $4.85, Connellsville. Furnace coke is $2.65 to $2.75, Connellsville, while by-product foundry coke is steady at $9 to $9.40, delivered, Newark; $11, delivered, New England points; and $9, delivered, Philadelphia.

Detroit, Sept. 17.—Gray iron foundries are taking a little more by-product foundry coke. Automotive foundries still are slack but those on implement and stove and furnace work are operating better. Domestic demand shows some improvement. By-product foundry coke is $9, Detroit ovens, or $9.50, delivered Detroit.

Cincinnati, Sept. 17.—Specifications for by-product foundry coke in this district for Septemer will be slightly below August, according to some estimates. Prices remain firm. One dealer placed 31 cars of beehive coke for spot shipments during the past week.

St. Louis, Sept. 17.—While new ordering of metallurgical coke is in moderate volume, shipments are considerably above the average for this season. Melters are taking in contract quotas as due. The price of foundry coke remains unchanged.

Birmingham, Ala., Sept. 17.—Coke production is steady, by-product coke works in this district operating close to capacity. Surplus stocks of coke, mainly domestic, are not large. By-product foundry coke continues $5, base, Birmingham.

Coke Prices

Prices per Net Ton

Beehive Ovens	
Connellsville furnace	$2.65 to 2.75
Connellsville foundry	3.75 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25
By-Product Foundry	
Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England del.	11.00
St. Louis del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit, ovens	9.00
Philadelphia, del.	9.00

Bolts, Nuts, Rivets

Contracting Proceeds—Railroads Better Buyers—Operate 75 Per Cent

NUT AND BOLT PRICES, PAGE 744

Pittsburgh, Sept. 17.—Fourth quarter contracting for bolts, nuts and rivets gradually is getting under way, with prices for that period unchanged from current quotations. Specifications are well maintained, particularly for this period. Railroads are better buyers in some directions, with a seasonal increase in their requirements. Jobbers also are contributing well to current demand. Operations are unchanged at 75 per cent, with some plants on a higher basis.

Chicago, Sept. 17.—Steady progress is being made in fourth quarter contracting for bolts, nuts and rivets, but shipping orders against third quarter contracts show no increase. Slight improvement is shown in automotive specifications. Producers' operations continue at 70 to 75 per cent. Bolts and nuts are 60 to 70 per cent off list. Wrought washers are 6.75c, Chicago. Lock washers are 85 off to consumers, and 85 and 5 off to dealers and jobbers.

Philadelphia, Sept. 17.—Fourth quarter bolt, nut and rivet contracts now are being entered in this territory at unchanged prices. New York Shipbuilding Corp. is expected soon to place a large tonnage of bolts, nuts and rivets in connection with new vessel contracts.

New York, Sept. 17.—Bookings of bolts and nuts thus far in September have been about 10 per cent under the August rate. With makers announcing unchanged prices for fourth quarter, buying is expected to continue of a hand-to-mouth character. Eastern operations are averaging slightly better than 60 per cent.

Cleveland, Sept. 17.—Nut and bolt demand has picked up considerably since Sept. 1 and now is normal. Fourth quarter contracting is proceeding at unchanged figures. Partial night shifts are being maintained. One company employing 700 during the day has a night shift of about 100 workmen.

Ferroalloys

Shipments Brisk, But Lower Than in Recent Months

Pittsburgh, Sept. 17.—Shipments on ferroalloy contracts are unusually high for this period but some recession is noted compared with the activity of preceding months. This decline, however, is slow. Activity in the spot market is light, but occasional small orders are placed, with current prices of $109.79, delivered Pittsburgh, for ferromanganese and $34 for spiegeleisen well maintained. Ferrosilicon is steady. Ferrotungsten is quotably unchanged but only fairly active.

New York, Sept. 17.—Ferromanganese is unchanged at $105, duty paid, with specifications still coming out briskly. Domestic spiegeleisen, 19 to 21 per cent, also is steady at $34, furnace, in carload lots, with larger quantities subject to differentials. English spiegeleisen, 26 to 28 per cent, is unchanged at $36.50, duty paid.

Ferroalloy Prices

(In dollars, except ferrochrome)

Ferromanganese, 78 to 82 per cent tidewater, duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent, domestic furnace, spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.45 to 1.50
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producer's plant, net ton	160.00
Do., one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent	122.50

†Carloads. Differentials apply to large quantities.

*These prices contract, spot $5 higher.

Scrap

Price Structure Generally Is Softer—Supplies Are Increasing and Melters Restrain Buying

HEAVY melting steel has been sold at Chicago at $15.50, a decline of 25 cents. Borings also are off in that market. At Cleveland the blast furnace grades are weak, and water receipts lighter. Steel has been sold at Buffalo at $17.50 to $17.75. Canadian foundries are buying more cast.

Chicago, Sept. 17.—Melting steel is quoted at a top of $15.50, a drop of 25 cents, the result of a tonnage sale at that figure. Dealer trading remains at $15 to $15.25, and the consumer range $15 to $15.50. Fabricating industries have more supplies to offer than at any previous time this season. Spirited bidding results for desirable railroad scrap, some of which is bought for delivery at outlying consuming points. Slightly lessened steelworks operations have borne no marked influence on scrap consumption thus far, but most dealers are operating on the possibility of even lower prices within a week. The Gary consumer being out of the market, resistance to prices from other consumers seems more marked. Short selling is active in cast borings, down 25 cents. The weakness is inspired in part by a large producer offering of about 1000 tons. Heavier automobile production also promises expanded supplies in that grade. Yards are short of prepared scrap.

Boston, Sept. 17.—A peculiar situation developed in the scrap market as the week advanced. The price range became somewhat irregular, but owing

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated

Steel Work Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 13.50
Boston, dealers	12.00 to 12.25
Boston, No. 2	10.00 to 10.50
Buffalo, No. 1	16.50 to 18.00
Buffalo, No. 2	14.75 to 15.00
Chicago	15.00 to 15.50
Cincinnati, deal.	14.00 to 14.50
Cleveland, No. 1	16.50 to 17.00
Cleveland, No. 2	14.75 to 15.00
Detroit, No. 1 deal.	14.25 to 14.75
Detroit, No. 2 deal.	11.50 to 12.00
East Pa., del. mill	16.50
N. Y., deal. R. R.	12.50 to 13.35
N. Y., deal. yd.	8.25 to 9.25
Pittsburgh, No. 1	18.00 to 18.50
St. Louis, No. 1	14.50 to 15.00
Valleys, No. 1	18.50 to 19.00

COMPRESSED SHEETS

Buffalo (dealers)	14.75 to 15.00
Chicago	13.50 to 14.00
Cleveland	15.50 to 16.00
Detroit, dealers	14.00 to 14.25
E. Pa. new mat.	15.50 to 16.00
Pittsburgh	18.00 to 18.50
Valleys	18.00 to 18.50

BUNDLED SHEETS

Buffalo	12.00 to 12.50
Cincinnati, deal.	11.25 to 11.75
Cleveland	12.50 to 13.00
Eastern Pa.	11.50 to 12.00
Pittsburgh	16.50 to 17.00
St. Louis	10.50 to 11.00

SHEET CLIPPINGS LOOSE

Chicago	8.75 to 9.25
Cincinnati	9.00 to 9.50
Detroit, dealers	9.50 to 10.00
St. Louis	10.50 to 11.00

STEEL RAILS, SHORT

Birmingham	14.00 to 15.00
Boston	11.00 to 12.00
Buffalo	19.25 to 19.75
Chicago (3 feet)	18.50 to 19.00
Chicago, 2 ft. and under	19.50 to 20.00
Cincinnati, deal.	18.50 to 19.00
Detroit, dealers	17.00 to 17.50
Pittsburgh (3 ft.)	20.00 to 21.00
Pittsburgh, 2 ft. and under	21.00 to 22.00
St. Louis	18.00 to 18.50

STOVE PLATE

Birmingham	11.00 to 12.00
Boston consumers	11.00 to 11.50
Buffalo	12.75 to 13.25
Chicago, net	11.50 to 12.00
Cinn., deal., net	9.25 to 9.75
Detroit, net, deal.	9.50 to 10.00
Eastern Pa.	12.00 to 12.50
N. Y., deal., mill	8.00 to 8.50
St. Louis	13.00 to 13.50

COUPLERS, SPRINGS

Buffalo	19.25 to 19.75
Chicago	17.00 to 17.50
Eastern Pa.	21.50
Pittsburgh	21.00 to 21.50
St. Louis	15.75 to 16.25

ANGLE BARS—STEEL

Chicago	17.25 to 17.75
St. Louis	16.00 to 16.25

LOW PHOSPHORUS

Buffalo, billets and bloom crops	19.50 to 20.00
Cleve. billet and bloom crops	17.50 to 18.00
Eastern Pa.	21.00 to 22.00
Pitts. billet and bloom crops	23.00 to 23.50
Pitts, sheet bar crops	22.00 to 22.50

FROGS, SWITCHES, GUARDS

Chicago	16.00 to 16.50
St. Louis	17.00 to 17.50

SHOVELING STEEL

Chicago	15.00 to 15.50
Cleveland	11.75 to 12.25
Detroit, dealers	9.00 to 9.50
St. Louis	14.75 to 15.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston, dealers	11.00 to 11.50
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	16.00 to 16.50
Chicago, No. 1	15.75 to 16.25
Chicago, No. 2	15.00 to 15.50
Cinn., No. 2	14.00 to 14.50
Eastern Pa.	16.00 to 16.50
N. Y., No. 1 deal.	12.00 to 12.50
Pittsburgh, No. 2	18.00 to 18.50
St. Louis, No. 1	13.75 to 14.25
St. Louis, No. 2	14.50 to 15.00

SPECIFICATION PIPE

Boston	9.75 to 10.00
Eastern Pa.	15.00
New York, deal.	10.25 to 10.75

BUSHELING

Buffalo, No. 1	14.75 to 15.00
Chicago, No. 1	13.00 to 13.50
Cinn., No. 1 deal.	11.00 to 11.25
Cinn., No. 2	7.00 to 7.50
Cleveland, No. 1	14.50 to 15.00
Cleveland, No. 2	10.25 to 10.50
Detroit, No. 1 deal.	13.00 to 13.50
St. Louis, No. 1	10.00 to 10.50
Valleys, new No. 1	16.00 to 16.50

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston	6.60 to 7.50
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cincinnati, deal.	8.50 to 9.00
Cleveland	10.00 to 10.50
Detroit	8.75 to 9.25
Eastern Pa.	12.00 to 12.50
New York, deal	8.00 to 8.50
Pittsburgh	12.00 to 12.50
St. Louis	7.50 to 8.00
Valleys	11.00 to 11.25

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	6.00 to 6.25
Buffalo	12.00 to 12.50
Cincinnati, deal.	9.00 to 9.50
Cleveland	10.25 to 10.75
Detroit, dealers	9.50 to 10.00
Eastern Pa.	11.00
New York, deal.	7.00 to 7.25
Pittsburgh	12.50 to 13.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	7.00 to 8.00
Boston, chem.	9.75 to 10.00
Boston, dealers	6.50 to 6.75
Buffalo	12.00 to 12.50
Chicago	10.25 to 10.75
Cincinnati, deal.	9.25 to 9.75
Cleveland	10.25 to 10.75
Detroit, dealers	8.75 to 9.25
Eastern Pa.	11.75 to 12.00
Eastern Pa., chem.	14.50
New York, deal	7.50 to 8.00
Pittsburgh	12.50 to 13.00
St. Louis	9.50 to 10.00

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	12.25 to 12.75
Chicago, net	11.75 to 12.25
Cincinnati	10.00 to 10.50
Eastern Pa.	12.00 to 12.50
New York, deal.	8.75 to 9.25
St. Louis	13.00 to 13.50

FORGE FLASHINGS

Boston, dealers	10.00 to 10.50
Buffalo	13.75 to 14.25
Cleve. over 10 in.	13.50 to 14.00
Detriot	13.00 to 13.50

FORGE SCRAP

Boston, dealers	9.00 to 9.50
Chicago	18.50 to 19.00
Eastern Pa.	14.00 to 14.50

ARCH BARS AND TRANSOMS

Chicago, net	21.00 to 21.50
St. Louis	21.50 to 22.00

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	14.25 to 14.75
Chicago, steelworks	12.50 to 13.00
Cleveland	14.00 to 14.50
Eastern Pa.	15.00
Pittsburgh	16.00 to 16.50
St. Louis	10.00 to 10.50

STEEL CAR AXLES

Birmingham	17.00 to 18.00
Boston, ship point	17.50 to 18.00
Buffalo	19.50 to 20.00
Chicago	19.05 to 19.60
Eastern Pa.	23.00 to 23.50
Pittsburgh	21.00 to 22.00
St. Louis	19.50 to 20.00

SHAFTING

Boston, ship point	14.00 to 14.50
Chicago	17.35 to 17.90
Eastern Pa.	19.00 to 20.00
New York, deal.	14.00 to 14.50
St. Louis	18.50 to 19.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	11.50 to 12.50
Boston, iron	14.00 to 14.50
Buffalo, iron	14.00 to 14.50
Buffalo, steel	19.25 to 19.75
Chicago, iron	14.00 to 14.50
Chi., rolled steel	19.00 to 19.50
Cincinnati	12.50 to 13.00
N. Y., iron, deal.	12.00 to 12.50
Pittsburgh, iron	16.00 to 16.50
Pittsburgh, steel	21.00 to 21.50
St. Louis, iron	15.00 to 15.50
St. Louis, steel	19.50 to 20.00

No. 1 CAST SCRAP

Birmingham, cup.	13.00 to 14.00
Buffalo	15.75 to 16.25
Boston, textile	14.00 to 14.50
Chicago, mach.	16.80 to 17.35
Chicago, railroad	15.10 to 15.65
Chicago, agri.	15.15 to 15.70
Cincinnati., mach. cupolas, gross	19.00 to 19.50
Cleveland, cupola	15.75 to 16.25
Detroit, net, deal.	12.00 to 12.50
East Pa., cupola	16.00 to 17.00
N. Y., cup., deal.	12.50 to 13.00
N. Y., del. local foundries	17.00
Pittsburgh, cupola	15.00 to 16.00
San. Fran., del.	13.50 to 14.00
Seattle	14.50 to 14.75
St. L. No. 1 mach.	15.25 to 15.75
St. Louis, No. 1	14.50 to 15.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	12.75 to 13.25
Cleve., breakable	12.50 to 12.75
Detroit, auto, net dealers	12.00 to 13.00
Detroit, break. deal	9.00 to 9.50
Eastern Pa.	14.50 to 15.00
New York, deal.	11.50 to 12.00
Pittsburgh	13.00 to 13.50

MALLEABLE

Boston, railroad	18.50 to 19.00
Buffalo	18.00 to 18.50
Chicago, agri.	15.50 to 16.00
Chicago, railroad	17.00 to 17.50
Cinn., R. R., deal.	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail.	17.50 to 18.00
Detroit auto deal.	15.25 to 15.75
St. Louis, rail	16.00 to 16.50

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	13.50 to 14.50
Boston	12.00 to 12.50
Buffalo	16.50 to 17.00
Chicago	17.50 to 18.00
Eastern Pa.	18.00 to 18.50
New York	12.75 to 13.25
St. Louis	17.25 to 17.75

LOCOMOTIVE TIRES

Chicago, cut	18.50 to 19.00
St. Louis, No. 1	15.50 to 16.00

LOW PHOS. PUNCHINGS

Chicago	17.25 to 17.75
Pittsburgh	20.50 to 21.00

to the situation existing these price changes are regarded as of little importance. Due to weakness in Pittsburgh, prices were shaded slightly, but efforts to buy materials find many brokers holding to the best figures. The German Steamship CROSHAGEN is loading 4500 tons for Danzig, which resulted in some buying.

New York, Sept. 17.—While no price revisions have been made, the local scrap dealers' market is soft. Continued absence of some of the leading consumers from the market, with one or two, in fact, still holding up on shipments, has had a pressing influence. Some grades that were regarded as scarce recently are now more plentiful, notably No. 2 melting steel. Dealers' buying prices on some grades are little more than nominal, particularly in certain grades of cast scrap.

Buffalo, Sept. 17.—Tonnage sales of No. 1 heavy melting steel have been made to district melters at $17.50 to $17.75 or possibly $18. Sales were of strictly No. 1 material. Railroad lists which came here brought $17.75, Buffalo. Additional sales are looked for this week. Deliveries on orders are large. Cast and stove plate demand has been satisfied for the present.

Cleveland, Sept. 17.—Except blast furnace grades, iron and steel scrap market here is fairly steady, supported largely by a considerable short interest. Dealers still are paying $15.50 for the lighter grade of steel for the leading consumer. No. 1 steel is bringing $16.50 to $17. Buying at above this quotation has disappeared. A tonnage of railroad steel was sold at $18.20, delivered mill. No. 2 steel is generally bringing $15, with some buying at $14.75. Specifications have been increased slightly by the leading consumer. A second mill is taking steadily while the third is well out of the market. Lethargy continues in blast furnace scrap, now quoted lower at $10.25 to $10.50. Machine shop turnings seem to be established at around $10.50. Mills here are receiving little scrap by boat from Michigan.

Cincinnati, Sept. 17.—Prices on heavy melting steel and No. 2 railroad wrought were lowered 25 cents the past week, although mills in the district are accepting shipments as usual. The easier market also was reflected in a similar cut for mixed borings and turnings.

St. Louis, Sept. 17.—The market for scrap iron and steel eased off further the past several days, being affected by more plentiful offerings and renewed price resistance by mills. Some quotations were reduced, mainly the steel grades, but no heavy tonnages have changed hands at the lower figures. With somewhat less pressure from the agricultural movement, the railroads have found time to forward scrap in heavier volume. The higher prices of the past several weeks have permitted of shipments from outside points, and this has augmented supplies. Generally, yard stocks continue light. The melt holds up well, and there is considerable scrap still to be bought. Dealers look upon the present reaction as temporary, and anticipate a revival of demand by the end of this month or early in October.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron Axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	15.00
Iron axles	17.00
Heavy melting steel	9.50
Turnings	7.50
No. 1 mach. cast (net)	16.00
Malleable (net)	12.50

Philadelphia, Sept. 17.—Activity in the scrap market is restricted to small lots at unchanged prices. There is no test for heavy melting steel, which appears somewhat weaker, and it is unlikely that consumers now would have to pay above $16.50. Jobbers report that September, so far, has been the poorest month of the year from the standpoint of bookings. Prices are firm and unchanged.

Birmingham, Ala., Sept. 17.—While the scrap market still is lagging, dealers are watching their stocks well, shipping against contracts on which delivery has been slow. Heavy melting steel is not being moved as steadily as a few weeks ago, a number of open-hearth furnaces being out of commission. Steel holds at from $10.50 to $13.50. Foundry grades are quiet.

Toronto, Ont., Sept. 17.—With prospects of continued and in some respects improved business for the remainder of the year, a more active buying movement has developed in the Canadian markets. Future placing has been in better volume, and spot demand has stepped up. Most current demand, however, is in iron grades. Steel grades are moving slowly in the Toronto and Hamilton districts, but have a good call at Montreal. Prices are firm but unchanged.

Pittsburgh, Sept. 17.—Scrap is slightly more active, but the market still is quiet and although strength is lacking, prices give indications of holding recent levels. Some small sales of heavy melting have been made recently at $18.25 and $18.50, giving this grade some basis for quoting in contrast to the nominal situation prevailing heretofore. Demand still is restricted and most mills are out of the market.

Semifinished Steel

Demand Is Lighter—Contracting More Restricted

SEMIFINISHED STEEL PRICES, PAGE 744

Pittsburgh, Sept. 17.—Occasional sales of billets and sheet bars are reported in small lots, but fourth quarter contracting is restricted. Current business generally takes the $35 price, which gives indications of being maintained on new business during the coming quarter. Operations of finishing mills of some semifinished buyers have declined markedly the past 30 to 60 days and this is postponing future commitments for raw steel. A few of the larger semifinished producers still have only a limited supply of steel available for the open market, but stocks generally are sufficiently large to accommodate customers. Specifications against existing contracts are fairly well maintained. Prices on forging billets and wire rods continue firm at $40 and $42, respectively.

Philadelphia, Sept. 17.—Several contracts for billets for fourth quarter were placed in the past week at $35, base, Pittsburgh, for rerollers and $40 for forging. Some contracts for wire rods have been placed at $42, base, Pittsburgh.

Youngstown, O., Sept. 17.—Books are being opened by local mills for fourth-quarter semifinished steel orders. Some sheet and stripmakers are covering their needs for that period, at $35, Pittsburgh and Youngstown. Rods and manufacturers' wire continue to furnish most of the backlog for wiremakers. With some mills here September business measures up to August. Wire rods hold at $42, Pittsburgh and Cleveland.

Cleveland, Sept. 17.—The leading local producer of merchant semifinished steel is closing contracts for fourth quarter with regular customers at $35, Cleveland or Youngstown, the same basis as prevailed in the third quarter. A considerable portion of its output is covered. Operations continue at 100 per cent.

Enameled Ware Lower

Washington, Sept. 17.—July shipments of enameled ware were low for the year but substantially higher than in July, 1928. A comparison of the seven-month total with the same time last year also shows a decided gain, according to the department of commerce. Comparisons follow:

	In dozens			
1928	Total	White	Gray	Colored
July	277,684	125,653	108,584	43,447
Total (7 mo.)	2,411,865	1,104,043	861,408	446,414
Aug.	358,811	164,580	134,191	60,040
Sept.	352,484	172,127	130,337	50,020
Oct.	417,387	190,424	166,078	60,885
Nov.	328,875	139,197	123,850	65,828
Dec.	324,445	132,422	136,170	55,853
Total, 1928	4,191,761	1,900,275	1,552,034	739,452
1929				
Jan.	427,871	199,589	138,480	89,802
Feb.	390,577	178,589	131,206	80,782
March	449,425	183,191	166,368	99,866
April	463,577	194,971	137,764	130,842
May	352,885	156,195	109,165	87,525
June	337,375	147,285	89,919	100,171
July	291,332	127,058	91,254	73,020
Total, (7 mo.)	2,713,042	1,186,878	864,156	662,008

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has purchased the Bissell Electric Co., a jobbing supply house at Toledo, O.

Bars

Specifications Larger in Aggregate—Shipments to Automotive Interests Slightly Increased

BAR specifications are slightly more active. Chicago producers report demand for alloy and soft steel grades stimulated by renewed shipments to automotive interests. This influence also is felt in the East. Larger tonnages of hot-rolled merchant bars also are going forward to consumers. New business represents current requirements, contracting for fourth quarter being light.

BAR PRICES, PAGE 743

Pittsburgh, Sept. 17.—Specifications for hot-rolled merchant bars are slightly more active, with consumers closing out on old contracts. With the fourth quarter price unchanged from 1.95c, Pittsburgh, there is little incentive for buyers to specify heavily at this time and incoming business largely represents current requirements. The recent rate of business is regarded as marking the low point of the year, with prospects for an upturn during October. Cold bar finishers have been buying on a small-lot basis, reflecting the lighter activity in the automotive industry. No official announcements have been made on fourth quarter prices but contracts are being taken at 1.95c, Pittsburgh. Delivery is prompt on most sizes of bars, with backlogs generally representing from one to two weeks' work.

New York, Sept. 17.—Steel bar demand continues good, with the market at a 1.95c, Pittsburgh, minimum. Deliveries are being maintained at three to four weeks on the general run of specifications.

Philadelphia, Sept. 17.—Considerable steel bar business for fourth quarter delivery has been placed here, generally at 1.95c, base, Pittsburgh, subject to occasional concessions. Specifications show an improvement.

Detroit, Sept. 17.—Soft steel bar specifications thus far in September fall short of last month and are considerably below the peak of the year. Demand has not come back since Labor day and the outlook for an October bulge in automobile production is less bright. Ford purchasing is lighter. Less material is coming from Cleveland and Buffalo by water. Mills usually quote 1.95c, Pittsburgh, while 1.90c, Cleveland, is done by Cleveland mills. Books have not been formally opened for fourth quarter, but no change is anticipated. Alloy steel bar makers are continuing their 2.65c, mill, price into the new quarter.

Chicago, Sept. 17.—Both alloy and soft steel bar specifications are being stimulated slightly by renewed automotive shipping orders, but less influence is felt here than in the East, local producers report. Bar mill operations have been reduced to 80 to 85 per cent, while shipments against third quarter contracts are commensurate with the operating rate. A number of departments of the implement makers, except those producing heavy tractors and harvesting machinery, now are operating close to normal rates. Makers of road machinery and excavating equipment are maintaining fairly uniform specifications. One bar producer is booking important fourth quarter tonnage from regular mill customers on the basis of 2.05c to 2.15c, Chicago, for soft steel bars, but the leading producer has made no formal price statement and has not actually closed on tonnage for that period, despite active inquiries. Bar mill deliveries are prompt to five weeks, depending upon size and section ordered.

Cleveland, Sept. 17.—While miscellaneous merchant steel bar orders keep up fairly well, aggregate tonnage is much lower than in the June-July period. In fact, some nearby mills can only operate 50 per cent of capacity. Deliveries are made promptly, some mills being able to work in new business with scheduled rollings and thus effect immediate shipment. Fourth quarter contracting is making some progress at levels the same as during the third quarter.

Sales Group Plans Meet

Springfield, Mass., Sept. 17.—The Sales and Advertising Managers' association will open its fall and winter season with a meeting at the Hotel Kimball Monday. J. E. Redman, sales manager of the automotive division, American Bosch Magneto Co., Springfield, is president and J. J. Slein, Graton & Knight Co., Worcester, secretary.

Plates

Market Is Quieter, Mills Gradually Working Out Backlogs—New Orders Continue High

NEW orders for plates and shipments show a reduction from recent peaks, in eastern and middle western districts. The volume of new business, however, is above the average for this period of the year. The Milwaukee welder of pipe has reduced its plate and skelp specifications about 75 per cent, shipments to it recently running as high as 45,000 tons monthly.

PLATE PRICES, PAGE 743

Pittsburgh, Sept. 17.—Plate producers gradually are working off backlogs with the lifting of pressure that existed during preceding months, but incoming business is seasonally heavy. Prospects for increased activity in car buying have improved recently and barge inquiry is fairly heavy. The outlook for additional business in large diameter line pipe, however, is not bright. Additional barge awards are lacking but a fair volume of new business is in prospect. Plate producers have made no formal announcement of fourth quarter prices but business for that period will be booked on the basis of 1.95c, Pittsburgh.

Cleveland, Sept. 17.—Plate orders, while small individually, are large in the aggregate. Outside mills usually name three to five weeks deliveries, but a local mill seems able to make almost immediate shipment. Fourth quarter contracting is progressing slowly. The price is steady at 1.95c, base, Pittsburgh.

Philadelphia, Sept. 17.—An order for 5500 tons of plates has been booked by an eastern Pennsylvania mill for 1000 hopper body repairs to be done by the Virginia Bridge & Iron Co. for the Norfolk & Western railroad. The trade is now interested in an inquiry from the same railroad for 2000 new 57 ½-ton hopper cars on which bids will be opened Sept. 27, and for which 22,000 tons of steel, mainly plates, and also 16,000 wheels and 8000 axles will be required. Plate prices are steady.

Chicago, Sept. 17.—Plate mills have sufficient backlogs for virtually full operations for a few weeks, despite a reduction of about 75 per cent from the peak shipments of plates and skelp to the Milwaukee welder of pipe. These shipments had been running as high as 45,000 tons monthly. Fabricators have booked 1500 tons of tank plates for the Southwest. Of the 18,000 to 20,000 tons outstanding in inquiry from the Southwest a week ago, about 6500 tons have been placed with eastern and southern plate mills in five lots. About 5000 tons of tank work is on inquiry for refineries in West Texas. About 400 to 500 tons of plates and light structurals are up for bids from Great Lakes shipbuilders. Texas-Empire Pipe Line Co. is reported filling and testing its Cushing-Chicago line between Oklahoma and

the Illinois line, and construction is going ahead between the latter point and Chicago. One producer has booked fourth quarter plate tonnage at 2.05c, base, Chicago.

New York, Sept. 17.—United States Steamship Co.'s vessel for Porto Rico service, awarded to Bethlehem Shipbuilding Corp. Ltd., will take 8900 tons of plates. The local department of water supply will ask bids shortly on 4000 tons of 54-inch steel pipe for Brooklyn, N. Y. The Standard Oil Co. of New York files plans for five tanks for Staten Island, N. Y., requiring an aggregate of 100 tons. Northern New Jersey district water supply commission, Newark, N. J., in rejecting recent bids, will take new figures in about a week on 500 tons of steel pipe.

Approximately 21,000 tons of plates will be required for the 2000 hopper cars wanted by the Norfolk & Western and 1000 hopper cars for the Southern railway. This is out of a total of about 27,000 tons of plates, shapes and bars required for them. One thousand automobile box cars wanted by the Southern will take a total of approximately 6000 tons of steel, most of the material in the form of shapes and bars.

Detroit, Sept. 17.—The Detroit city water intake on which George R. Cooke Co. is low calls for 2025 tons of sheet piling.

CONTRACTS PLACED

8900 tons, vessel for Porto Rico service, United States Steamship Co., New York, to Bethlehem Shipbuilding Corp. Ltd.
3500 tons, 35,000 feet of 48-inch pipe, Everett, Wash., to Steel Pipe & Tank Co.
2200 tons, 36-inch and 48-inch pipe line, Spokane, Wash., to Steel Pipe & Tank Co.
1000 tons, boilers, tanks, etc., for new plant of Puget Sound Pulp & Timber Co., Everett, Wash., to Puget Sound Machinery depot.
400 tons, six locomotive boilers for Great Northern railway, to Puget Sound Machinery depot.
300 tons, two steel syphons for flume project at Manson, Wash., to Steel Tank & Pipe Co.

CONTRACTS PENDING

4000 tons, 54-inch steel pipe, New York department of water supply, Brooklyn, N. Y. Bids to be asked soon.
500 tons for steel pipe for northern New Jersey district water supply commission, Newark, N. J. Bids rejected; new bids in about a week.
360 tons, 18-inch welded steel pipe line, Montecito, Calif. Bids opened.
100 tons, five tanks, Standard Oil Co. of New York, Staten Island, N. Y. Plans filed.

Plans Conduit Works

Youngstown, O., Sept. 17.—Republic Iron & Steel Co. plans to build a metal conduit works at its Trumbull site at Warren, O. Plans as yet are nebulous, according to President E. T. McCleary, but is is likely they may be prepared some time in the autumn. It may be that rumors of this conduit plant coming to Warren led recently to unfounded reports of portions of the Elyria, O., works being moved to Warren.

Pipe

Detroit Buys 2500 Tons—Some Smaller Orders Let—Steel Pipe Demand Heavy—Cut Prices Go

DETROIT awarded 2500 tons of cast pipe and Columbus, O., 1000 tons to domestic makers. Public utilities have not yet lined up fall and winter programs. One foundry gets 30,000 feet for two Ohio districts. Quotations are steady. Steel pipe demand is heavy and a demoralized price situation in the East gradually is disappearing. One oil interest bought 1750 tons for export.

PIPE PRICES, PAGE 744

New York, Sept. 17.—Cast pipe business still is largely confined to single carloads with prices somewhat steadier. Weakness is more evident on larger tonnages. The New York & Richmond Gas Co. will purchase pipe, mostly 8-inch, for a 11-mile extension. Jersey City inquires for 450 tons of 36-inch flexible joint pipe; several hundred tons will be needed for sewer work by Norwalk, Conn., and 1000 tons of 3 to 12-inch pipe for the state hospital at Wassaic, N. Y., will be placed this week. Foundries operate at 60 to 70 per cent.

Following weeks of an almost demoralized price situation here, resellers of merchant pipe are increasing their prices from $10 to $15 a ton. These increases were inaugurated not alone by some jobbers but by certain mills having large stocks here on consignment. Levels now quoted by the majority of resellers provide a reasonable profit. In recent weeks many sales were made not only at cost but below cost, it is said.

One of the Standard Oil companies has recently closed on 25 miles of 8-inch pipe for Argentina, approximately 1750 tons.

Boston, Sept. 17.—The fact that most pipe makers are well booked up, especially on the larger diameters, has resulted in rather limited tonnages here. Private business is holding up, though municipal lettings are practically out of the picture for the time being.

Pittsburgh, Sept. 17.—Pipe is quiet from the standpoint of large diameter line pipe work. Little change is noted in demand for merchant material. Remaining line pipe projects give little prospect of being closed this year and new work is lacking. Producers are receiving a steady volume of business in other tubular products, with the bulk made up of small individual lots. Demand for buttweld lags behind lapweld activity. Seamless business is steady although there is no increase in demand from the oil country for drilling material. Mechanical tubing sales are fairly regular but lack the activity of midsummer. Pipe mill operations are unchanged at 80 per cent for welded and 70 per cent for seamless.

Cleveland, Sept. 17.—Jobber demand for standard full weight merchant pipe is about evenly divided between black and galvanized with the former slightly more in favor. It is difficult to obtain satisfactory deliveries of large sizes but small sizes of buttweld are shipped immediately on receipt of order. Lapweld and seamless mill operations are practically full.

Chicago, Sept. 17.—While a fair sprinkling of small-lot pressure pipe orders is reported, no important municipal work is outstanding. Public utilities have not prepared in full their fall and winter buying programs. No date has been set for bids for the Chicago intake tonnage of large-sized water pipe. Some private inquiry is reported, including 300 tons of 6 and 8-inch pipe at East Chicago, Ind. Prices for carload business remain steady on the basis of $37 to $38, base, Birmingham, or $45.20 to $46.20, delivered, Chicago.

Birmingham, Ala., Sept. 17.—Recent pressure pipe lettings have been encouraging though the aggregate was relatively small. Unfilled tonnage is still sufficiently large to defer a seasonal lull for a month or more. Pipe shipments are steady, no small amount going to the far west. Several specifications are in sight and producers intimate that spring demand will be good. Quotations are unchanged at $37 to $38 on 6-inch and over sizes, the latter price for less than car lots.

CONTRACTS PLACED

15,000 feet, 4 to 8-inch pipe for Franklin county, O., to McWane Cast Iron Pipe Co.
15,000 feet, 6-inch pipe for Newark, O., to McWane Cast Iron Pipe Co.
2500 tons, 36-inch pipe for Detroit, to Lynchburg Foundry Co.
1000 tons, 20 and 24-inch pipe for Columbus, O., to James B. Clow & Sons.
100 tons, fittings and offsets for Chicago, to Alabama Pipe Co.

STEEL PIPE

1750 tons (approximately) 25 miles of 8-inch line pipe for Standard Oil Co. New York, for shipment to Argentina, to unstated interest.

CONTRACTS PENDING

20,000 feet, 4-inch pipe for Chaffee, Mo.
625 tons, 24-inch water line extension for Lackawanna, N. Y.
450 tons, 36-inch flexible joint cast pipe for water line under Hackensack river, Jersey City, N. J.
300 tons, 6 and 8-inch pipe for private buyer, at East Chicago, Ind.
200 tons of 8-inch and 300 tons of 12-inch class C pipe for Milwaukee; bids close Sept. 24.
Unstated tonnage, 6 to 24-inch cast pipe for sewer extension, Norwalk, Conn.

Unstated tonnage, mostly 8-inch for 11-mile extension at Staten Island, N. Y., for the New York & Richmond Gas Co.

Tin Plate

Market Situation Satisfactory for This Period of Year

TIN PLATE PRICES, PAGE 744

Pittsburgh, Sept. 17.—Tin plate specifications are in good volume for this period. Although producers have small backlogs, operations are at a high seasonal level. The average for the district is slightly better than 80 per cent. Reports indicate large crops of corn and tomatoes, with the pack of the latter expected to be considerably in excess of the light 1928 pack. General line can requirements are steady and in fair volume. Tin plate continues $5.35 per 100-pound base box, Pittsburgh.

New York, Sept. 17.—Tin plate demand is reflecting seasonal dullness, with little change expected until new contract prices have been announced. Export inquiry is moderate and includes some tonnage for the Japanese army. The Japanese inquiry is a revival of one issued some time ago.

Pails and Tubs Gain

Washington, Sept. 17.—Production of pails and tubs in July increased slightly over the low month of June but was lower than July, 1928. A comparison of the seven months totals with the same period in 1928 shows a decrease, according to the department of commerce. Monthly comparisons follow:

(In dozens)

	PAILS, TUBS		OTHER WARE	
1928	Production	Shipments	Production	Shipments
July	114,342	121,415	61,688	47,856
Total (7 mo.)	1,118,455	1,123,381	295,668	274,263
Aug.	127,797	142,487	37,846	44,377
Sept.	150,845	139,183	55,850	50,606
Oct.	153,813	152,258	56,469	54,596
Nov.	131,792	103,290	33,553	34,012
Dec.	112,923	102,802	36,042	23,567
Total	1,795,625	1,763,401	515,428	481,421
1929				
Jan.	151,106	165,745	40,649	36,896
Feb.	151,019	170,813	60,471	43,329
March	211,252	211,516	50,055	49,549
April	165,155	171,722	55,778	55,632
May	176,622	150,501	43,370	38,597
June	98,857	104,762	37,479	35,334
July	105,454	109,841	42,384	44,117
Total (7 mo.)	1,059,465	1,084,900	330,186	303,454

Laclede Lets Tube Mill

Laclede Steel Co., St. Louis, announces completion of plans for manufacture of pipe and tubular products at its Alton, Ill., plant. Contract has been let to St. Louis Structural Steel Co. for a new building, 300 x 400 feet, where standard merchant pipe, mechanical tubing and electric conduit pipe will be fabricated. Other products of the company include open-hearth steel billets and hot and cold-rolled strip steel.

Sheets

Production and Shipments Holding to High Average, but New Orders Decline

PITTSBURGH sheet manufacturers report a considerable reduction in new orders, while at Chicago marked interest is shown in future contracting. In eastern districts buying has picked up. Shipments generally are maintained at recent high averages, unfilled orders representing about four weeks work. New demands from the automotive industry are light.

SHEET PRICES, PAGE 743

Pittsburgh, Sept. 17.—Incoming sheet business shows a marked decline from the rate of preceding months, but shipments are well maintained. The excess of production over orders is reducing backlogs and deliveries have been improved on most grades. Unfilled orders still represent about four weeks' work and the outlook is regarded as promising for the fourth quarter. Automotive sheet requirements as yet have not increased and little improvement is expected until new models have been completed and some indication of their reception is received by builders. Mills are attempting to eliminate the 3.50c price on galvanized and the majority are naming 3.60c for fourth quarter. The situation in this material, however, still is unsettled and the market remains quotable at a range of 3.50c to 3.60c. Prices generally are firm on other grades, with black sheets 2.85c, tin mill black 3.00c, 13-gage blue annealed 2.35c, and automobile sheets 4.10c. Operations hold at 95 per cent.

New York, Sept. 17.—While the 3.50c Pittsburgh, price has not disappeared, galvanized sheets are tending more strongly toward a 3.60c, Pittsburgh minimum, with sellers generally announcing this figure for fourth quarter. Black sheets are holding at 2.85c, Pittsburgh; blue annealed plates at 2.20c, Pittsburgh, and blue annealed sheets at 3.35c.

Philadelphia, Sept. 17.—Considerable contracting for sheets for fourth quarter was noted in the past week, at prevailing prices, namely 3.50c to 3.60c, base, Pittsburgh, for galvanized, black generally at 2.85c, with occasional differentials to large users, and blue annealed at 2.20c and 2.35c.

Cincinnati, Sept. 17.—New tonnage booked by sheet mills in this district increased backlogs the past week. Automobile factories and others specified liberally. Prices are steady.

Buffalo, Sept. 17.—Demand for full finished sheets continues good. The price is firm at 4.365c, Buffalo. Black sheet demand is somewhat less active than at the peak of the year.

Youngstown, O., Sept. 17.—Independent sheetmakers in this district started 93 per cent of their capacity Monday, unchanged from a week ago. Some makers of blue annealed have overtaken orders after an extraordinarily busy spring and summer, while some makers of full-finished sheets are busily engaged in scraping together sufficient specifications to maintain full operations from week to week. Other makers of commonly used grades are filled to capacity until the third week of October. Common black sheets here are 2.85c, Pittsburgh. Autobody holds at 4.10c, although rumors persist of a slightly lower quotation in some instances. No. 9 and 10 gage blue annealed is 2.20c, and 13 gage 2.35c. Galvanized brings 3.60c, though competition is met down to 3.50c.

Cleveland, Sept. 17.—Some sheet mills in northern Ohio are operating full, but backlogs are not large. Day to day orders are heavy in the aggregate. Automotive tonnage is increasing. Metal furniture material is holding its own. A local body plant is making about 3000 bodies daily for Chevrolet sixes and is buying sheets accordingly. Contract renewal prices are 2.85c for black, 3.60c for galvanized, 2.35c for No. 13 blue annealed and 4.10c for full finished, base Pittsburgh.

Detroit, Sept. 17.—Most automotive buyers of sheets have taken prices on fourth quarter requirements but, except Chevrolet, none of the larger ones has closed. Producers generally have quoted third quarter levels, including 4.10c, Pittsburgh, for autobody and 2.85c for black. The net price on autobody is not always the sum of the base plus extras. Ford specifications are tapering, as body changes approach. Chrysler and Buick are specifying heavier.

Chicago, Sept. 17.—Sheet mill operations are being maintained at close to 90 per cent in this district. An independent unit has its mills going full. Marked interest is shown in future contracting. Mills are being forced to turn away tonnage on blue annealed, and orders are accumulating steadily for the lighter gages. Blue annealed backlogs extend well into November, while black and galvanized orders are four to five weeks. The mill price for No. 24 black is 3.05c, for No. 24 galvanized 3.70c, and for No. 13 blue annealed 2.45c. Quotations for local delivery are $1 a ton higher.

St. Louis, Sept. 17.—Sheet prices are steady, and demand generally continues well up to expectations. Specifications by the automotive and car building industries have fallen off further, but improvement in the former is expected soon.

Structural Shapes

Shape Awards Diversified—Total Above 45,000 Tons—7720-Ton Job Let at Buffalo—4700 Tons Up at Newark

HOTELS, bridges, office buildings and garages all figure importantly in the week's shape awards. Fifteen or more such jobs were let taking 1000 to 7720 tons apiece, topped by the Buffalo city hall. A number of smaller ones aid in bringing the week's aggregate lettings into line with the recent weekly average above 45,000 tons after a temporary setback last week, when jobs awarded totaled but 20,717 tons. Much important work looms just ahead. Included is the 4700-ton freight terminal at Newark, N. J., and a 6500-ton automobile assembly plant at Edgewater, N. J. Plain material specifications remain active. Contracts are being written at unchanged figures for fourth quarter. Fabricating shops are operating at high rates, several at 85 to 95 per cent.

STRUCTURAL SHAPE PRICES, PAGE 743.

New York, Sept. 17.—Fourth quarter contracts are being made at unchanged prices, 2.195c to 2.245c. Mills operate at near capacity to meet deliveries. While some reduction in building contracts is reported, the decline is largely confined to smaller structures. Projects requiring large steel tonnages are numerous and the new volume which may be classed as active remains high. A 2400-ton hotel at Atlantic City, N. J., was awarded McClintic-Marshall Co. New inquiries include three 1000-ton jobs.

Boston, Sept. 17.—Three awards to structural interests last week accounted for 650 tons. One 350-ton job is pending. The largest letting was for 350 tons for a local apartment, awarded New England Structural Co.

Philadelphia, Sept. 17.—Shape demand is only fair and eastern mills continue to operate somewhat under capacity. A Pittsburgh mill booked 1000 tons of shapes and bars from the Virginia Bridge & Iron Co. for repairs to 1000 hopper bodies for the Norfolk & Western railroad.

Pittsburgh, Sept. 17.—The structural shape market is less active in awards although fabricators are well engaged and specifications for plain material are off only slightly. Recent awards have been most numerous in small individual lots and inquiry, although fairly steady, shows few substantial tonnages. The market on plain material continues 1.95c, Pittsburgh, with fourth quarter contracting on the same basis.

Buffalo, Sept. 17.—McClintic-Marshall Co. was awarded 7720 tons of structural steel for the new Buffalo municipal building by the John W. Cowper Co., general contractor. It is understood that Bethlehem sections produced at Lackawanna will be used.

Chicago, Sept. 17.—Structural mills have fair promise in the building up of fresh backlogs later, despite a marked thinning of order books in tonnage for early shipment. Structural mill operations are not over 85 per cent. It is expected operations may be reduced further the next 30 days. Plain material deliveries are from prompt to four weeks. About 12,000 tons in new business has been closed, including 5000 tons for the 1930 bridge and maintenance requirements of the Great Northern railroad. A Chicago garage took 2500 tons and Oklahoma highway bridge projects call for 2000 tons. Higway bridge work in Indiana will take about 1000 tons. Numerous plain structural inquiries are out for fourth quarter, as well as for specific work. It is understood the fourth quarter range will be 2.05c to 2.15c, Chicago.

Cleveland, Sept. 17.—All shape awards for the district this past week involved 500 tons or less. The majority were for less than 100. A convent at Euclid, O., 500 tons, went to Pittsburgh Bridge & Iron Co. The general contract for the jail-courts building here, 1580 tons, went to Hunkin-Conkey Construction Co., which will probably buy the steel in a week. A 3000-ton department store is up at Akron, O. Fourth quarter contracting on shapes is progressing favorably. The 1.95c, Pittsburgh, price continues strong.

CONTRACTS PLACED

27,100 tons, Waldorf-Astoria hotel, New York, to McClintic-Marshall Co. Reported as 24,000 tons Sept. 5 by IRON TRADE REVIEW.

7720 tons, municipal building, Buffalo, to McClintic-Marshall Co. through John N. Cowper Co., general contractor.

5000 tons, 1930 bridge and maintenance requirements for Great Northern railroad, to American Bridge Co.

2500 tons, garage, National Parking Co., Quincy street, Chicago, to American Bridge Co., through Starrett Building Co., general contractor.

2500 tons, office building and garage, J. J. Greenberg, Philadelphia, to McClintic-Marshall Co.

2400 tons, hotel, Atlantic City, N. J., to McClintic-Marshall Co.

2000 tons, highway bridges, in Oklahoma, to J. B. Klein Iron & Foundry Co.

1650 tons, plant, Puget Sound Pulp & Timber Co., Everett, Wash., to Isaacson Iron Works.

1600 tons, Henry street bridge, Philadelphia, to Phoenix Bridge Co.

1500 tons, plant, Midland Steel Products Co., Detroit, to R. C. Mahon Co.

1500 tons, Architects' building, Philadelphia, to McClintic-Marshall Co.

1300 tons, church, Hanson place, Brooklyn, N. Y., to George A. Just Co.

1200 tons, addition to forging plant, Chevrolet Motor Co., Detroit, to McClintic-Marshall Co.

1000 tons, Grand Central station extensions, New York, to McClintic-Marshall Co.

1000 tons, highway bridges, Palisades park, approaches to Hudson river bridge, New Jersey, to American Bridge Co.

930 tons, building, First National Bank & Trust Co., Hamilton, O., to Wheeling Structural Steel Co.

700 tons, addition to public school No. 203, Brooklyn, N. Y., to Harris Structural Steel Co.

650 tons, hangars for Brazil, to Belmont Iron Works.

600 tons, public school, No. 34, Queens, New York, to Easton Structural Steel Co.

500 tons, tennis court building, East Sixty-fourth street, New York, to Hdden Iron Construction Co.

500 tons, Convent of the Good Shepherd, Euclid, O., to Pittsburgh Bridge & Iron Co.

500 tons, (sheet piling) New York Central railroad dock, Toledo, O., to Bethlehem Steel Co.

400 tons, West Garfield street bridge, Seattle, to Pacific Car & Foundry Co.

400 tons, School of Arts, Boston, to A. K. Smith Iron Works.

350 tons, grandstand, Agua Caliente, Mexico, to Consolidated Steel Corp., Los Angeles.

350 tons, apartment, Newbury street, Boston, to New England Structural Co.

325 tons, warehouse, American Can Co., San Francisco, to Judson-Pacific Co.

300 tons, stock trestle, Diamond Alkali Co., Painesville, O., to American Bridge Co.

275 tons, plant for United States Phosphorus Co., Tampa, Fla., to Ingalls Iron Works Co. Inc. This is in addition to 655 tons now being erected.

270 tons, airplane hangars, Valley Stream, Long Island, N. Y., to Jones & Laughlin Steel Corp.

200 tons, 4-story building, Church and Cortland streets, New York, to American Bridge Co.

200 tons, Herbert Hoover high school, San Diego, Calif., to National Iron Works.

200 tons, apartment, Van Ness and Greenwich streets, San Francisco, to Golden Gate Iron Works.

200 tons, building, Country club, S.O.M. Center road, near Cleveland, to Kilroy Structural Steel Co.

200 tons, miscellaneous work in Rockford, Ill., and vicinity, to A. C. Woods & Co.

200 tons, administration building, General Steel Castings Corp., Eddystone, Pa., to Shoemaker Bridge Co.

180 tons, plant, Edison Electric Illuminating Co., Woburn, Mass., to unstated fabricator.

165 tons, indoor field cage, gymnasium, etc., Waterville, Me., to Lyons Iron Works.

150 tons, apartment, Sacramento & Mason streets, San Francisco, to Judson-Pacific Co.

145 tons, two bridges, Zion National park, Ogden, Utah, to unnamed fabricator.

130 tons, bridge girders, Chicago, Rock Island & Pacific railroad, to American Bridge Co.

120 tons, plant, United States Rubber Co., Providence, R. I., to Providence Steel & Iron Co.

120 tons, bridge over San Lucas river, Salinas, Calif., to United States Steel Products Co.

110 tons, dormitory, University of California, Berkeley, Calif., to Pacific Coast Engineering Co.

Awards Compared

	Tons
Awards this week	45,855
Awards last week	20,717
Awards two weeks ago	50,755
Awards this week in 1928	79,928
Average weekly awards 1928	39,082
Average weekly awards, 1929	42,047
Average weekly awards, Aug.	45,764
Total awards to date, 1928	1,474,256
Total awards to date, 1929	1,597,794

110 tons, building, Champion Machine & Forging Co., Cleveland, to Wheeling Structural Steel Co.
105 tons, Rouge River bridge, Detroit, to McClintic-Marshall Co.
100 tons, miscellaneous work, including Shaker Heights town hall, Shaker Village, O., to Republic Structural Iron Works.
100 tons, addition, New Weston hotel, Madison avenue and East Forty-ninth and Fiftieth streets, New York, to Paterson Bridge Co.
100 tons, building, Walsh Motor Co., Charlotte, N. C., to McClintic-Marshall Co.

CONTRACTS PENDING

6500 tons, plant at Edgewater, N. J., Ford Motor Co., Detroit. A. Kahn Co., architect; to be awarded late this week.
4700 tons, freight terminal building, Newark, N. J.
3700 tons, (revised), Wendell Phillips high school, Chicago.
3000 tons, powerhouse, Super Power Co. of Illinois, Powerton, Ill.
3000 tons, Polsky department store, Akron, O. Bids being taken.
2000 tons, building, Michigan Bell Telephone Co., Saginaw, Mich.
2000 tons, building, Girard college, Philadelphia.
2000 tons, building for I. Fischman & Sons, Philadelphia. General contract to Turner Construction Co.
1580 tons, jail-courts building, Cleveland. General contract to Hunkin-Conkey Construction Co.
1100 tons second bridge in Henry street, Philadelphia.
1000 tons, state highway bridges, New York.
1000 tons, Yale university building group, New Haven, Conn.
1000 tons, Fresh Kills bridge, Borough of Richmond, Staten Island, N. Y.
850 tons, highway bridge, Janesville, Wis.
850 tons, highway bridges, Lake county, Ind.
738 tons, bridge over Shasta river near Yreka, Calif. Bids opened.
525 tons, state highway bridge at Kewaunee, Wis.; bids close Sept. 26.
500 tons, highway bridge, Kewanee, Wis.
400 tons, plant, Vogt Meat Packing Co., Philadelphia.
400 to 500 tons, barge work and ship repairs for a Great Lakes builder.
350 tons, hockey rink, Lowell, Mass.
335 tons, west approach, St. John's river bridge, Portland, Oreg. Bids opened.
300 tons, bridge work, Union Pacific railroad, Chicago.
300 tons, building, Catholic Ladies of the Slovak Union, Cleveland. General contract to Crowell & Little Construction Co.
200 tons, power plant, M. J. Whittall Associates, Worcester, Mass.; general contractor, Morton C. Tuttle Co., Boston.
175 tons, highway grade separation work, Palos Park, Ill.
165 tons, federal aid bridge at Ontonagon, Mich.; Milwaukee Bridge Co. low bidder at $16,601.01 for steel only.
150 tons, Tacoma, Wash., airport. Bids in.
136 tons, grandstand, Riverside, Calif. Bids opened.
Unstated tonnage, Fourteenth avenue south bridge, Seattle. Bids Oct. 7.

Milwaukee Employment Stays at High Level

Despite the fact that the metal trades have shown a slight recession for the first time this year after eight months of record-breaking activity, Milwaukee employment still holds its consistent high level. At the beginning of September there were 43,736 at work in the shops regularly reporting, only 25 less than at the beginning of July. The increase over last year is 6351. In the metal industry there has developed a slight surplus of applicants and machine hand jobs as well as assembling. Toolmakers and experienced machinists are still in good demand, with practically no supply.

Concrete Bars

Lettings Usually Are Light —Fourth Quarter Contracts at Present Prices

QUIETNESS rules in most concrete bar markets, although specifications generally are said to be ahead of 1928. Occasional lettings are noted in the 100 to 500-ton range, with numerous small jobs being closed up. Prospects are bright at Buffalo with two jobs up totaling 3200 tons. Contracts are being written for fourth quarter needs at this quarter's price levels.

REINFORCING BAR PRICES, PAGE 743

New York, Sept. 17.—No price changes in concrete bars for fourth quarter are now expected, since mills have given no notice. Small lot shipments hold up well, but new inquiry is limited on sizable tonnages. Two subway contracts are expected to be closed soon, involving about 700 tons. Mill shipments are showing improvement and three weeks delivery is possible in most cases.

Pittsburgh, Sept. 17.—September is witnessing a slight improvement in specifications to mills for concrete reinforcing bars. Small-lot orders continue to account for the bulk of incoming business. Both demand and shipments still are running slightly ahead of the rate a year ago. Inquiry is fairly well maintained. The market continues 2.30c, Pittsburgh, for cut lengths and 2.05c for stock lengths.

Buffalo, July 17.—The John Johnson Construction Co. is the reported low bidder on the Attica state prison job, requiring 2600 tons of reinforcing bars. The city hall reinforcing bar tonnage, slightly more than 600 tons, has not been placed. These are the two largest tonnages in sight. Orders of this size command a price of 2.315c, Buffalo, but most orders are being filled from warehouse stocks at the usual figures.

Chicago, Sept. 17.—Billet reinforcing bar fabricators are contracting with the mills for fourth quarter. They also are taking fairly heavy mill shipments against building work closed in recent weeks. Rail steel bar shipments are close to a year ago. The substructure of the Wabash avenue bridge, Chicago, calls for about 450 tons of billet bars. Approximately 800 tons of bars were awarded last week for buildings and 200 to 300 tons for highway and paving work. Billet bar fabricators are seeking to maintain a minimum of 2.35c for carload lots.

CONTRACTS PLACED

650 tons, Christ hospital, Cincinnati, to Pollak Steel Co.
475 tons, Wilbur Wright school, Chicago, to Calumet Steel Co. Previously noted as going to unstated fabricator.
454 tons, Woodlawn culvert, Schenectady, N. Y., through Richard E. Weber, to Concrete Steel Co.
450 tons, substructure, Wabash avenue bridge, Chicago, general contract to Ketler-Elliot Co.
300 tons, bridges, Palisades park, N. J., to Igoe Bros.
300 tons, warehouse, Newark, N. J., to Truscon Steel Co.
200 tons, co-operative apartment building, 1530 North State street, Chicago, to Concrete Steel Co.
200 tons, territorial building, United States, government, Juneau, Alaska, to Concrete Steel Co., through N. P. Severin Co., Chicago, general contractor.
185 tons, New York state highway route No. 3232, through Richard E. Weber, to Concrete Steel Co.
150 tons, Frazier school, Syracuse, N. Y., through W. J. Burns Co., Syracuse, to Concrete Steel Co.
105 tons, building, Pittsburgh Plate Glass Co., Henryetta, Okla., to Truscon Steel Co., through Rust Engineering Co.
100 tons, Valley Drive school, Syracuse, N. Y., through Jenks & Venton Co., Syracuse, to Concrete Steel Co.
100 tons, building for De Pauw university, Greencastle, Ind., to Concrete Engineering Co.
100 tons, warehouse for unstated owner, Crosby street, Chicago, to Calumet Steel Co.

CONTRACTS PENDING

2600 tons, for Attica, N. Y., prison; John Johnson Construction Co. reported low bidder.
300 tons, stadium Notre Dame university, South Bend Ind.
285 tons, highway work in Sonoma county, Calif. Bids opened.
175 tons, (mesh) freight terminal, Newark, N. J.
160 tons, state highway bridge, Cedar Point road, Ohio. Bids in.
127 tons, west approach, St. John's river bridge, Portland, Oreg. Bids opened.

Awards Compared

	Tons
Awards this week	3,294
Awards last week	6,485
Awards two weeks ago	5,893
Awards this week in 1928	3,363
Average weekly awards, 1928	6,189
Average weekly awards, 1929	6,216
Average weekly awards, Aug.	6,009
Total awards to date, 1928	254,693
Total awards to date, 1929	236,209

Open Car Plant Oct. 1

Birmingham, Ala., Sept. 17.—Formal opening of the new local plant of the Pullman Car & Mfg. Corp., of Chicago, is scheduled for Oct. 1. Boilers have been fired, labor is being recruited, and machinery is being tested by the preliminary manufacture of a few cars.

Rails, Cars

Equipment Orders, Inquiries More Promising—10,650 Cars Pending—Atchison Wants 5854

ACTIVITY in rails, cars, locomotives and accessories is more pronounced. One order for 1000 gondolas was divided evenly. Norfolk & Western placed repairs on 1000 hoppers and wants 2000 new. A 50,000-ton rail order was placed; 100,000 tons more are expected within a week. With 4800 freight cars now on inquiry, one for 5884 is reported just issued. Accessory inquiry grows.

RAILROAD TRACK PRICES, PAGE 744

Chicago, Sept. 17.—Important rail and car buying is expected shortly in the west. Fully 100,000 tons of rails will soon be on inquiry from Chicago & Northwestern and Santa Fe roads it is reported. Nickel Plate also may be in rail market at an early date. Other reports point to 5000 cars being on inquiry shortly. A rail producer in this territory has entered an order for 50 tons of rails and about 12,000 tons of track fastenings for one western road for its 1930 program. It will not submit specifications for about three weeks. Indications are that the western roads will begin taking shipments much earlier than in recent years. Rail mill operations in this district are about 75 per cent. Finishing departments producing track accessories operate at 70 to 75 per cent.

The 1000 mill-type gondola cars ordered by the Chicago, Milwaukee, St. Paul & Pacific railroad will require about 16 tons of finished steel each for their superstructure. Specifications involving 15,000 to 20,000 tons of steel are expected on that order within two to three weeks. It is understood Chicago & Eastern Illinois will rebuild 500 gondola cars in addition to 500 just ordered. Pacific Fruit Express is expected shortly to award 400 refrigerator cars that have been on inquiry for some time.

New York, Sept. 17.—Definite inquiry for 2000 steel hopper cars has been issued by Norfolk & Western. An inquiry is reported current from Atchison for 5854 freight cars.

Approximately 10,650 freight cars are pending throughout the country. Passenger cars pending are negligible. Southern Railway inquiries for 1000 steel hoppers and 1000 automobile box cars.

Philadelphia, Sept. 17.—Pennsylvania railroad is inquiring for 8000 kegs of track spikes.

Pittsburgh, Sept. 17.—A fair volume of replacement business in track fastenings is coming out, and with new inquiry increasing, aggregate business makes a favorable showing for this period. Interest is centered on the recent inquiry of the Chesapeake & Ohio railroad, bids on which closed Sept. 14. This inquiry included 10,000 tons of tie plates. Prospects are fairly bright for a good volume of rail business and car inquiry also is heavier. Light rail demand is fairly heavy in the aggregate.

CAR ORDERS PLACED

Canadian National, one combination passenger and baggage gasoline rail motor car, to J. G. Brill Co.

Central of Georgia, 500 50-ton all-steel box cars and 50 steel underframe flats, to Pullman Car & Mfg. Corp.

Chicago, Milwaukee, St. Paul & Pacific, 1000 mill-type gondola cars; 500 to Pressed Steel Car Co., and 500 to Bettendorf Co.

L. G. Everist, air dump car, to Koppel Industrial Car & Equipment Co.

Great Northern, 300 ore cars to own shops.

H. W. Kaylor, four dump cars, to Koppel Industrial Car & Equipment Co.

New York, New Haven & Hartford, four diners, to Pullman Car & Mfg. Crop.

Norfolk & Western, rebuilding 1000 steel hoppers, to Virginia Bridge & Iron Co.

Wagener Quarries Co., two air dump cars, to Koppel Industrial Car & Equipment Co.

Winsted Bros. Co., Minneapolis, 150 air dump cars, to Western Wheeled Scraper Co.

LOCOMOTIVES ORDERS PLACED

Chile Exploration Co., three 76-ton electric locomotives to the Westinghouse Electric & Mfg. Co., which company has also booked a number of small electric locomotives comprising the following: Two each for Anaconda-Cananea Copper Co., Virginia Iron, Coal & Coke Co., Clover Splint Coal Co., Weyerhauser Timber Co., Seattle, and one each for the New Idria Quicksilver Co., Dillon & Orr, and Spring Valley Water Co.

CAR ORDERS PENDING

Atchison, Topeka & Santa Fe, reported inquiring for 5854 freight cars, involving 3500 box, 500 each gondola, automobile and refrigerator cars, 300 stock, 200 ballast, 150 flats, 104 caboose and 100 tank cars.

Chicago & Eastern Illinois, rebuilding of 500 gondola cars in addition to award of 500 recently.

Delaware & Hudson, three baggage-mail cars.

E. I. Du Pont de Nemours & Co., 45 alcohol cars.

New York, New Haven & Hartford, 75 40-ton coke cars, a revision of a previous inquiry for 75 coke car bodies.

Norfolk & Western, 2000 steel hopper coal cars, previously noted as contemplated. This is in addition to its contract for rebuilding 1000 steel hoppers, awarded Virginia Bridge & Iron Co.

Pennsylvania, five passenger, smoking and baggage gasoline-electric rail motor car bodies.

Reading, two passenger trailers cars.

Southern, 1000 steel hopper and 1000 automobile box cars.

South African Railways, Johannesburg, South Africa, 150 50-ton freight cars.

Shape Shipments Increase

Washington, Sept. 17.—Shipments of structural shapes in August, as computed by the department of commerce, aggregate 34,650 tons more than in July. For eight months this year the total stands at 369,600 tons more than for the comparable period in 1928. Monthly comparisons follow:

	—New orders— Actual tonnage	% of capacity	Shipments Computed tonnage	Computed capacity
1928				
Aug.	295,431	92	354,200	288,750
Eight mos.	.....	75	2,163,700	1,978,900
Sept.	266,269	83	319,550	273,350
Oct.	210,454	65	250,250	319,550
Nov.	203,760	63	242,550	273,350
Dec.	207,499	64	246,400	281,050
Year	.....	71	3,280,200	3,126,200
1929				
Jan.	227,103	71	273,350	281,050
Feb.	222,723	70	269,500	238,700
Mar.*	296,343	93	358,050	277,200
Apr.*	†276,109	87	334,950	304,150
May*	‡281,364	89	342,650	311,850
June*	§279,724	89	342,650	292,600
July	¶277,119	91	350,350	304,150
Aug.	289,326	95	365,750	338,800
Eight mos.	.....	86	2,637,250	2,348,500

*Revised.

†Reported by 231 firms with a capacity of 317,430 tons.

‡Reported by 227 firms with a capacity of 314,370 tons.

§Reported by 218 firms with a capacity of 312,885 tons.

¶Reported by 193 firms with a capacity of 302,990 tons.

Mileage Scale Rates Put Off Till Dec. 20

Washington, Sept. 17.—Just prior to the action of the interstate commerce commission last week in postponing the effective date from Oct. 20 to Dec. 20 of the new iron and steel mileage scale rates to go into effect as the result of the commission's decision in connection with part 6 of investigation 17,000, a petition was filed with the commission on behalf of the chambers of commerce, operators of manufacturing plants and others concerned in New Jersey asking for hearings on the proposed rates as they affect shippers in that region. This petition was in addition to that part of the authority of the port of New York.

Specific complaint of the action of the commission in including New Jersey in the New York group was made by the New Jersey petition. The claim was made that the prescribed rates to and from the New York group are inflated rates, which were fixed at a measure materially higher than the normal scale of prescribed rates. This was done, it is said, to compensate the carriers for certain exceptional terminal services, such as lighterage, car float, and trucking services in New York City and New York harbor.

Call for Bok Entries

The Harvard Business school states that entries for the Edward W. Bok advertising awards for 1929 must be received by the school by Dec. 13, 1929. The awards include a gold medal to the individual or organization deemed by the jury of awards to merit recognition for distinguished services to advertising, four awards of $1000 for distinguished individual advertisements, and four awards of $2000 for four advertising campaigns, and $2000 for the most meritorious work in advertising research.

Wire

Fourth Quarter Contracts Being Closed at Unchanged Prices—Market Moderately Active

WHILE books have not opened officially in some districts, contracts for wire and wire products for fourth quarter are being signed at unchanged prices. New business at Pittsburgh is moderately heavy following a brief lull. Operations in the Chicago district average 50 per cent. Production in the East is holding up the recent high rate. The nail market is quiet.

WIRE PRICES, PAGE 744

Pittsburgh, Sept. 17.—Incoming business in wire products is moderately heavier following a lull over the preceding week when holiday influences retarded business. Producers have not officially opened books for fourth quarter but contracts are being taken, with prices unchanged from current levels of 2.40c to 2.50c, Pittsburgh, for manufacturers' wire and $2.55 to $2.65 for wire nails. The wire price situation is slightly unsettled, the market showing more strength in some sections than in others.

Worcester, Mass., Sept. 17.—Despite a decrease in requirements for the automobile trade, wire production is maintaining its high rate. Advances in other lines have kept total production up to earlier season marks, and there is little prospect that succeeding months will fall below that high point. Demand is steady and varied. Prices are steady at 2.75c, base, Worcester, for plain bright wire.

Cleveland, Sept. 17.—Wire continues active but nails are slow. Prices named for fourth quarter are 2.50c on wire and $2.65 on nails, although a price as low as $2.40 was recently quoted in this territory. Some progress is reported in contracting for fourth quarter.

Chicago, Sept. 17.—While some departments of western wire mills are operating at a higher rate, the average operations for this territory are estimated at not much above 50 per cent. A slight gain is noted in jobbing orders for wire products. A number of contracts have been signed for fourth quarter on prevailing quotations, although some mills are reported shading the price of $2.60 to $2.70, Chicago or western mills, for nails. Autumn woven fencing demand has not begun to materialize.

Cold Finished Steel

Specifications Picking Up—Contracting Is Slow

COLD FINISHED PRICES, PAGE 744

Pittsburgh, Sept. 17.—Fourth quarter contracting for cold-finished steel bars is proceeding slowly. As there is no change in prices customers are in no hurry to place future requirements. The current 2.30c, Pittsburgh, figure is firm. Specifications increased the past week following the slow period occasioned by the holiday, and incoming business is comparing favorably with that of the preceding month.

Cleveland, Sept. 16.—Specifications for cold finished bars are holding their own, with miscellaneous consuming lines outside the automotive industry and are improving slightly within it. One or two automobile parts makers are specifying freely, but a few hold back awaiting the resumption of activity expected this fall. Contracting for fourth quarter has made some strides at the unchanged price of 2.35c, Cleveland.

Detroit, Sept. 17.—Books have been opened for fourth quarter unchanged at 2.30c, Chicago, or 2.57½c, delivered Detroit. Buying has been light, and specifications thus far in September are considerably short of the first half of August. Mills can make prompt delivery.

Eastern Steel Treaters To Hear Fry

New York, Sept. 17.—A special joint meeting of the New York and New Jersey chapters, American Society for Steel Treating, will be held Sept. 19, at the Merchants' Assembly room, Woolworth building, New York, at 8 p.m.

Dr. Adolph Fry, internationally known metallurgist and scientist, with the Krupp Research laboratories, Essen, Germany, will speak on the "Nitriding Process."

Strip

Fourth Quarter Contracting Is Slow—Backlogs Are Light, Deliveries Prompt

AUTOMOTIVE tonnage is coming back slightly in strip steel. Fourth quarter contracting activity grows. Price weakness seems confined to the extension of the 2.75c price on cold strip, whereas 2.85c had been announced, and an occasional mill instead of Pittsburgh base on hot. Deliveries are easier as backlogs taper, hot being two weeks and cold three.

STRIP PRICES, PAGE 744

Pittsburgh, Sept. 17.—Strip requirements of automotive interests for October in most cases represent an increase over September. Operations of the Ford Motor Co. are off slightly and orders for strip correspondingly lower. Current operations of strip mills largely are dependent upon the day-to-day run of business, with backlogs practically depleted. A fair volume of unfilled business is on books but mills are able to ship new business promptly. Operating schedules for the week call for a 75 per cent rate, although this is dependent upon the rate of incoming business over future days. Fourth quarter contracting is under way, with prices unchanged from current levels of 1.90c and 2.00c, Pittsburgh, for hot strip and 2.75c, Pittsburgh, generally, for cold-rolled strip.

Philadelphia, Sept. 17.—Strip steel contracts are being renewed for the fourth quarter at prevailing prices, which are firmly maintained. This does not apply to wide strips over 24 inches, in connection with which there have not yet been any developments.

New York, Sept. 17.—Deliveries on strip steel are easier, with cold rolled offered around at three weeks on an average and hot rolled at two weeks. While local demand is rather slack, the market is unchanged at 1.90c to 2.00c, Pittsburgh, depending upon width, and 2.75c to 2.85c, Pittsburgh, on cold-rolled strip, although the inside figure in this latter case is the more representative.

Cleveland, Sept. 17.—As autumn advances, demand for strip steel increases slightly, although it has far to go before it reaches the proportions prevailing in June and July. Many automotive customers are still paring down specifications. There is no rush to cover for fourth quarter. Prices are unchanged at 1.90c to 2.00c, Pittsburgh, on hot rolled depending upon width and at 2.75c, Cleveland-Pittsburgh, for large tonnages of cold.

Chicago, Sept. 17.—Hot rolled strip backlogs run about two weeks and cold about three. While no forward contracting is reported in hot rolled, some cold-rolled contracts have been signed for fourth quarter. Hot and cold mill operations average about 75 per cent. Quotations for the narrower sizes of hot-rolled strip, 6-inch and less, now are 2.10c to 2.20c, Chicago, instead of 2.10c to 2.30c. For wider hot-rolled strips, 2.00c is quoted. Cold strip is quoted 2.75c to 2.85c, Pittsburgh-Cleveland.

Nonferrous Metals

Copper and Lead Continue Strong But Prices Are Unchanged—Tin Shows Weakness—Sales of Zinc Are Light

Prices of the Week, Cents a Pound

	Copper: Electro delivered	Copper: Lake delivered	Copper: Casting refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. Louis	Zinc: St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Sept. 11	18.00	18.12½	17.87½	45.37½	46.00	6.90	6.72½	6.80	23.90	8.77½	35.00
Sept. 12	18.00	18.12½	17.87½	45.25	46.00	6.90	6.72½	6.80	23.90	8.80	35.00
Sept. 13	18.00	18.12½	17.87½	45.37½	46.12½	6.90	6.72½	6.80	23.90	8.80	35.00
Sept. 16	18.00	18.12½	17.87½	45.50	46.25	6.90	6.72½	6.80	23.90	8.37½	35.00
Sept. 17	18.00	18.12½	17.62½	45.25	46.12½	6.90	6.72½	6.80	23.90	8.62½	35.00

NEW YORK, Sept. 17.—Sales of copper and lead have subsided from the unusually high rate of a week ago. Although demand has eased off, both metals continue to hold firm positions in the market. Prices are unchanged.

The zinc market has remained quiet with prices steady. Tin quotations have fluctuated within comparatively narrow margins in line with the trend of conditions abroad, but buying in this country has lagged. Dullness still prevails in antimony trading.

Copper—Despite higher asking prices about ten days ago, prices ruling on actual sales have been at the 18-cent level established the middle of last April. Buying declined when it became apparent that consumers were well supplied on their September and October requirements and that a price advance was not likely for the immediate future. Export sales have been at normal rates from day to day but domestic buying dropped off to limited tonnages on Tuesday. The position of the market remains strong with domestic shipments very large and indications that total shipments for all of 1929 may rise to nearly 1,200,000 tons, or well above the high figure of 983,000 tons last year. Much of the present strength in copper is attributed to the copper wire business. Domestic shipments of copper bars to domestic users during the first eight months this year were 40 per cent larger than in the similar period of 1928. Increased buying of copper is expected soon since few domestic contracts have been placed for November shipments and European users still have much to buy for their needs throughout the remainder of the year. Refined copper stocks in the hands of producers in North and South America increased last month to their largest total in several years. August world copper output declined 818 tons from the July production. The workers' strike at the Chrome, N. J., copper plant of the American Metal Co. Ltd. is removing 5000 tons of copper from total output weekly. It is expected that the strike, which is contributing to the statistical strength of the market in view of output curtailment now in effect, may be settled the fore part of next week.

Lead—Sales of the heavy metal have been made at normal rates this week, mostly for prompt and October deliveries. The market continues strong. Refined lead produced in the United States and Mexico last month totaled 85,258 tons, a decline of 6305 tons from July production.

Zinc—Some buying has been reported but business as a whole has been quiet. Business has been done for early October shipments.

Tin—Consumers displayed an increase in buying interest on Monday, but this disappeared on Tuesday when only a normal amount of trading was done. Some group buying was reported in London, but advices also stated that the Rickard interests there were selling. Shipments of tin from the Straits Settlements during the first two weeks this month amounted to 3087 tons.

Antimony—Dullness continues to prevail in antimony.—*Daily Metal Trade.*

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

SHEETS	
Yellow brass (high)	23.25
Copper, hot rolled	27.75
Lead, full sheets (cut ¼c more)	10.00
Zinc sheet (100-pound base)	$10.25
Zinc strip (100-pound base)	$9.25
Aluminum, flat sheets, up to 10 gage, 3 to 72 inches wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	28.25
Copper	29.25
RODS	
Yellow brass (high, full turnings)	21.25
Naval brass	24.00
WIRE	
Copper	19.87½
Yellow brass (high)	23.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	12.00 to 12.50
Chicago	12.00 to 12.25
Cleveland	12.75 to 13.00
HEAVY YELLOW BRASS	
Cleveland	8.50 to 8.75
ZINC	
New York	3.25 to 3.50
Cleveland	3.25 to 3.50
HEAVY COPPER AND WIRE	
New York	14.75 to 15.00
Boston	14.50 to 15.00
Chicago	13.75 to 14.00
Cleveland	14.50 to 14.75
RED BRASS BORINGS	
New York	11.00 to 11.50
YELLOW BRASS TUBING	
Cleveland	8.50 to 8.75
LIGHT COPPER	
New York	12.75 to 13.00
Chicago	12.25 to 12.50
Cleveland	12.75 to 13.00
LIGHT BRASS	
Boston	7.00 to 7.25
Chicago	7.75 to 8.00
Cleveland	6.75 to 7.00
ALUMINUM	
Clippings, Cleveland	17.00 to 17.25
Borings, Cleveland	9.50 to 10.00
Cast, Cleveland	12.50 to 12.75
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt aluminum No. 12	17.00 to 17.50
Brass ingot, 85-5-5-5	16.00 to 16.25

Coke By-Products

Phenol Pressure Is Lighter—Prices Firm and Exports Fair

New York, Sept. 17.—Prices for light oil distillates are firm and unchanged. Shipments against contracts are steady. While production is holding, there appears to be no accumulation. Export business is fairly brisk and compares favorably with a year ago.

The pressure in the phenol market appears to be slightly relieved, although there is no evidence of sizable spot stocks available. Benzol producers are shipping promptly against contracts at unchanged prices and supplies are ample to meet the good demand. Toluol, solvent naphtha and commercial xylol are unchanged, with buying well spread.

Naphthalene, both flakes and balls, is being bought in fair repeat orders, with the heavy consuming season showing some recession. Repeat business is largely transacted on the inside of the price range. Sulphate of ammonia is firm and slightly more active as fertilizer interests are covering more actively. Prices are firm and export trade is fair.

Coke By-Products

Per Gallon at Producers' Plant in Tank Lots

	Spot
Pure Benzol	$0.23
90 per cent benzol	0.23
Toluol	0.40
Solvent naphtha	0.30
Commercial xylol	0.30
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.05½ to 0.06½
Naphthalene balls	0.06½ to 0.07½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.20 to 2.25

Warehouse

Sales Seasonally Good—Autumn Upturn Not Yet Arrived—September Sales Ahead of Same Period in August—Prices Unchanged

ALTHOUGH seasonally good, the autumn upturn in warehouse sales is not yet really in evidence. September so far, however, is ahead of August in many sections. Pittsburgh notes that sheets are active; Cincinnati and Philadelphia, bars and shapes; Chicago, cold-rolled steel; Price changes are not under immediate contemplation.

Philadelphia—Although demand on jobbers has been consistently slower than at any time previous this year, the trade is optimistic as to the outlook for fall business. To date, 1929 has been the biggest year Philadelphia jobbers ever have experienced both in tonnage and in profits. At present structural shapes and commercial bars are most active. Prices are unchanged despite efforts to obtain concessions.

Pittsburgh—Movement from local warehouses is maintained at a good seasonal rate, although the normal autumn business upturn is not yet well under way. Some jobbers, however, report a slight improvement over the August volume. Sheets remain active, with cold-rolled demand steady. Bars and plates move well.

Buffalo—Warehouse business continues good at Buffalo. Mill schedules are not adapted to small lots so that jobbers are acquiring volume in vigorous fashion. Prices are firm and unchanged. Plate, shape and reinforcing bar demand has been excellent.

Chicago—Orders for finished steel from warehouse stock are running ahead of August in most lines. Cold rolled steel, carbon and alloy bars, and plates are in heavy demand. Jobbers have difficulty in getting adequate shipments from mills to cover orders on blue annealed sheets. Light structural demand is fair. Steel warehouses report a price of $3, base, for wire nails.

Cincinnati—Bars and shapes continue to lead in demand for warehouse materials. Business is maintaining a somewhat better pace than in August.

St. Louis—Demand for iron and steel from store is irregular, but on the whole is satisfactory. Commodities going to highway construction, power installations, implement manufacture and municipal improvements are in brisk demand. Purchasing of miscellaneous materials by railroads has picked up.

Cleveland—Individual orders are larger and the total tonnage moving from the iron and steel warehouses in this district compares favorably with that moved during preceding months.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Houston	3.00c
Los Angeles	3.30c
New York†††‡	3.25c
Philadelphia*	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York††	2.80c to 3.24c
Philadelphia*	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.15c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl	2.65c
Los Angeles, lcl	3.00c
New York	2.90c to 3.30c
Philadelphia	2.75c to 3.10c
Pittsburgh	2.90c to 3.175c
San Francisco cl	2.00c
San Francisco lcl	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡	3.25c to 3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.10c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.60c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York‡‡	3.70c to 3.90c
Portland	3.75c
Philadelphia*†	3.25c
Pittsburgh**	3.35c to 3.45c
San Francisco	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.34c

NO. 24 BLACK SHEETS

Baltimore*†	3.75c
Boston	4.85c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Cleveland***	3.75c to 3.90c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York	3.90c to 4.00c
Philadelphia*†	4.10c
Pittsburgh**	3.85c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.89c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore*†	4.50c
Boston	5.60c
Buffalo	4.70c to 4.85c
Chicago	4.90c
Cincinnati	4.90c
Cleveland***	4.60c to 4.75c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.40c
Los Angeles	5.30c
New York	4.60c to 4.75c
Philadelphia*†	4.85c
Pittsburgh**	4.85c to 4.95c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	5.10c
St. Paul	4.68c
Tulsa	5.10c to 5.35c

BANDS

Baltimore	4.00c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chattanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit 3/16-in. and lighter	3.30c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	3.75c
Philadelphia*	3.30c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	4.50c to 4.69c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York‡‡	4.25c
Philadelphia*	3.55c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, Flats, hexagons, squares	
Baltimore (c)	3.50c(a)	4.00c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chattanooga*	3.85c	4.35c(d)
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.60c	4.10c
Philadelphia*	3.60c	4.10c
Pittsburgh	3.70c	4.20c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.64c	5.14c

(a) Rounds only; (d) Squares only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pounds lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.15c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL
New York duty paid

Hollow drill steel	13.00c
Iron bars, round	6.10c
Iron bars, flats and squares	6.50c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. **Less than 25 sheets. *†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Plate Awards in Pacific Northwest Best of Year—Coast Prices Are Steady

PIPE line projects at Spokane and Everett, Wash., call for 7500 tons of plates. Outdoor construction in the Northwest is unusually heavy and unemployment is light despite the end of the salmon season. New bolt, nut and rivet plant at South San Francisco is opened. Most steel awards in California have been small. West coast prices generally are steady and unchanged.

Seattle, Sept. 11.—Contracts involving more than 9000 tons of structurals and plates were awarded in the Pacific Northwest this week. These jobs are both municipal and industrial. Plate tonnages alone approximated 7500 tons, the heaviest lettings of any single week this year.

Business conditions continue more active than normal in this territory. There is a heavy volume of public outdoor construction work under way and additional important tonnages involving steel are to be awarded shortly. Considerable new work has developed recently.

Unemployment is at low ebb, the labor situation being satisfactory. Considerable labor has been released by the close of the Alaska fishing season, but the agricultural sections have recently taken on a large number of men. Lumber operations are below normal as conditions in this industry are unfavorable at present.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Both local buyers and exporting houses have submitted bids and are awaiting decision regarding the sale of 9000 tons of railroad material in store at Seattle since 1917. This consists of cars, axles and equipment originally intended for shipment to Russia. There is keen competition for the steel, with the odds favoring exporting houses who may be able to sell part of it to the soviet government for use on the Siberian broad-gage railroads. Domestic mills have bid on the basis of using the equipment for scrap.

Pig Iron and Coke

While the foundry situation shows some improvement over last month, as a whole the industry is quiet and many plants are short of work. Some new jobs have been booked but the season is backward. Stocks of pig iron and coke at plants in this territory are larger than normal and buying is at a minimum. No new orders for pig iron have been reported recently but small lots of Tyneside coke have been placed at $13.25.

Mill prices of these items are firm and steady at 2.35c. Reinforcing material is unchanged at 2.30c.

The largest reinforcing tonnage pending is involved in approaches for the St. Johns bridge, Portland, and is reported to approximate 2000 tons. Some of this steel will be placed immediately but for parts of the job reinforcing will not be required for some time. Lapointe Construction Co., Portland, on a bid of $267,603 was awarded the contract for the west approach. Local steel mills have a fair volume of tonnage in car lots on their books but have not taken any contracts in excess of 100 tons during the week. The Thurston county, Washington, courthouse, bids in, calls for 170 tons of reinforcing.

The largest plate job of the week went to the Steel Tank & Pipe Co. This involves about 3500 tons of 48-inch, ¼-inch to ⅝-inch pipe for the Sultan river pipe line, Everett. Colluccio & Arcorace have the general contract. Another contract for the same project, awarded to Coyle Construction Co., involves 2000 feet of 54-inch steel pipe and still is pending. About half of the Everett improvement went wood pipe, 6 miles of 52-inch, while seven miles of steel pipe is involved. The Steel Tank & Pipe Co. also booked about 2200 tons involved in a job at Spokane calling for 15,000 feet of 36-inch and 15,000 feet of 48-inch steel pipe. The low bid was $4.64 for the smaller diameter and $5.85 per foot for the 48-inch size. The same company also was awarded 300 tons involved in two steel syphons, 30-inch, 6300 feet long, for a flume project at Manson, Wash. Puget Sound Machinery Depot has the contract for constructing tanks, boilers and digesters for the plant of the Puget Sound Pulp & Timber Co., Everett, Wash., totaling 1000 tons. The same shop also has an additional contract to fabricate six large locomotive boilers for the Great Northern railroad, involving 400 tons, while other miscellaneous work at the same plant calls for an additional 1000 tons of plates.

Isaacson Iron Works this week booked 1650 tons structurals involved in the construction of the plant of the Puget Sound Pulp & Timber Co., at Everett, general contract to Albertson & Cornell Bros., of Tacoma. This is the only shapes tonnage of any size placed this week. New work involves several hundred tons for improvements at the Tacoma smelter and 150 tons for the Tacoma airport. Bids will be opened at Seattle Oct. 7 for the 14th avenue South bridge over the Duwamish river estimated at $780,000. Walle & Shattuck Construction Co. has the general contract at $110,075 for building two hangars and an administration building at the Swan Island airport, Portland, involving an unstated tonnage of steel. Washington state highway will open bids Sept. 24 for a 180-foot steel span over the north river near Raymond. Plans have been completed for a 265-foot steel bridge at Priest River, Idaho.

California Trade Quiet

San Francisco, Sept. 14.—(*By Air Mail*)—During the past week several important pipe line tonnages, involving more than 12,500 tons of plates, were placed, chiefly in the Pacific Northwest, and a number of structural steel projects were awarded. Movement in other lines, however was restricted to unimportant tonnages. Important pending projects include 738 tons for a bridge near Yreka, Calif., and 360 tons for a pipe line at Montecito, Calif. The price structure continues on a fairly firm basis.

The Pacific Coast Steel Co. this week opened its new 1200-ton per month bolt, nut and rivet plant at South San Francisco. The company served a luncheon in the new building to over 100 men of the trade, who later inspected the plant.

Pig Iron and Coke

Little of real importance has transpired in the pig iron and foundry coke markets during the week. Foundry operations, while showing some signs of improvement, are by no means active and as a result trading was confined to small tonnages for prompt shipment. No change in quotations has occurred.

Bars, Plates and Shapes

The weekly tonnage booked for concrete bars was the smallest of any week so far this year, less than 150 tons being placed. The average weekly total for the year is 1633 tons. To date this year 60,447 tons have been booked, compared with 66,607 tons a year ago. New business is not heavy. Bids have been opened on 285 tons for paving work in Sonoma county, Calif., and on 127 tons for a bridge approach in Portland. Los Angeles out-of-stock prices continue unchanged at 2.40c, base on carload lots and at 2.70c, on smaller tonnages. In the San Francisco district quotations are $2 a ton lower.

Plate bookings this week including Pacific Northwest orders, were the largest of any week so far this year and aggregated 10,530 tons, bringing the total for the year to 102,209 tons, compared with 22,406 tons for the same period a year ago. This is the first time in over four years that plate bookings have exceeded 100,000 tons. Prices continue on a firm basis at 2.35c, c.i.f. New business includes 360 tons for an 18-inch welded steel pipe line at Montecito, Calif.

While structural steel bookings fell below the weekly average for the year of 3722 tons, a number of projects were placed, totaling 2367 tons.

Tariff Bill Makes Little Progress as Opponents Attack Metal Rates

WASHINGTON, Sept. 17.—Another week of tariff discussion has been indulged in on the floor of the senate, with the result that some of the democratic members have had a good chance to poke fun at the bill. Senator Simmons of North Carolina, ranking democrat on the finance committee, has made his set speech; also Senator Harrison, of Mississippi, always eloquent if not entirely accurate.

Prior to getting down to the routine tariff speeches, efforts were made to have the Vare case brought up as unfinished business in the hope that tariff discussion could be further delayed. However, by a vote of 51 to 27 it was decided to leave the Vare case until the regular December session of congress.

Senator Harrison took a characteristic fling at the metal schedule saying:

Take pig iron, a basic material that goes into steel. They increased the duty here from 75 cents a ton to $1.50 a ton—a pretty big increase. Pittsburgh ought to feel pretty good about it. They have been taken care of. A dollar and a half a ton on pig iron. The domestic production of pig iron is 36,000,000 tons. Our importations in 1928 were 140,000 tons.

Was there ever a more complete understanding between interests than there is in the steel industry? Have they not got their institute? Do they not have their meetings? Are they not powerful enough to fix the prices? Yet in pig iron we have importations of only 140,000 tons, and we produce 36,000,000 tons and still they say, "You shall have a duty of $1.50 a ton." The United States produces 45 per cent of the whole world's output of pig iron, and yet you want to throttle the very small importation and put on this big increase.

Steel rods were granted six-tenths of 1 cent a pound, which amounts to an increase of 13 per cent ad valorem. The production is 2,800,000 long tons. We export 43,000 long tons, and there come into this country only 20,000 long tons; and yet you give this big increase on steel wire rods.

"It is stated by some of our opponents," said Senator James Watson, of Indiana, majority leader of the senate, "who have no intention whatever of following the advice of President Hoover, that we are not pursuing the course outlined by him in regard to the revision of the tariff.

"On industrial rates," continued Senator Watson, "the President said that he would like to see attention given to the products of those institutions that were 'lagging behind' in the United States. In other words, those that needed protection. Now, the finance committee heard everybody who wanted to be heard. It was divided into subcommittees and the democrats sat with the republicans throughout the hearings. Every person who came made his own statement as to the necessities of his case and then, when the republican members of the committee came together to formulate the measure, we had not only those statements but the testimony of the experts of the tariff commission and the treasury department who were familiar with the question at issue at the time."

Canada May Raise Tariff

Toronto, Ont., Sept. 17.—A new fiscal policy will be presented by the dominion government to parliament at its next session and it seems certain that an upward revision of the tariff will be included. Outstanding items for consideration in the tariff matter are iron and steel and coal, schedules for which have been under preparation by the advisory tariff board for some time. In regard to the tariff on iron and steel, the board is confronted with the task of reconciling differences between large steel manufacturers and large consumers, who are opposed to any increases in rates.

Back Manganese Duty

Washington, Sept. 17.—At the final session of its second annual convention here last week the American Manganese Producers' association went on record as favoring Senator Oddie's amendment to the senate bill, calling for a duty of 1½ cents per pound on metallic manganese content of all ores carrying more than 25 per cent manganese.

Inland Makes Record

A new output record was established in August by the Milwaukee sheet mills of the Inland Steel Co., Chicago, when 7142 tons was produced, compared with the previous monthly record of 7056 tons. The mill has been running at full capacity all this year and, according to E. G. Jones, general manager, bookings will require 100 per cent capacity for the remainder of the year. A large percentage of the output is absorbed by Milwaukee metal trades and automobile manufacturers.

Canadian Steel Market Gains Activity

Toronto, Ont., Sept. 17. — The iron and steel industry is gradually recovering from the slight seasonal depression of the summer, and entering an era that gives promise of more pronounced activity. The Dominion Iron & Steel Co., Sydney, N. S., has received an order for 400 tons of 70-pound rails, which with other contracts for the Canadian National Railways, will keep the rail mill running close to capacity until about Christmas. Other Canadian mills report practically capacity operations, with large order books, and a steady flow of new business covering a diversified range of products. While there has been no curtailment in pig iron production it is understood the Algoma Steel Corp. will blow out at least one stack toward the end of the month, when the mill will be shut down to enable construction to proceed.

Allis-Chalmers Mfg. Co. Gets La Crosse Plow

Stockholders of the LaCrosse Plow Co., LaCrosse, Wis., Sept. 12 voted approval of the sale of the business to the Allis-Chalmers Mfg. Co., Milwaukee. The LaCrosse company makes plows, harrows, disks, drills and cultivators, and was acquired to round out the Allis-Chalmers farm implement line marketed by the United Tractor & Equipment Corp. The LaCrosse concern was established in 1893 and has plant facilities of ten buildings with eight acres of floorspace. B. C. Smith is general manager.

Buys Soviet Manganese

Carnegie Steel Co., Pittsburgh, has signed an agreement with the Georgian government manganese ore trust for large quantities of manganese ore over a 5-year period, according to reports from Tiflis. In the first year the Carnegie company is to take from 60,000 to 75,000 tons of ore and in the remaining four years 50,000 tons annually. Other large American steel interests are reported negotiating for their manganese supplies.

Ralston Steel Car Co., Columbus, O., has orders on its books to keep it operating full the rest of the year.

Middle West Strip, Alloy Steel Makers Figure in Merger Talk

CLEVELAND, Sept. 17.—The Great Lakes Steel Corp., of Detroit, the Weirton Steel Co., of Weirton, W. Va., and the M. A. Hanna Co., of Cleveland, are sharing the merger limelight with the Eaton grouping of independent steel producers.

For several weeks it has been rumored at Detroit that the Weirton company was contemplating erecting a strip mill there or effecting a close affiliation with the Great Lakes Steel Corp., now building six open-hearth steel furnaces and a strip mill at Detroit.

The M. A. Hanna Co. owns two blast furnace stacks at Zug Island, near Detroit, one of which is to be rebuilt to supply hot metal for the Great Lakes corporation. One rumor involves a consolidation of the three companies, another that an operating agreement between the three is being perfected.

The arrangement between the Hanna company and Great Lakes corporation is now almost tantamount to an operating agreement, it is stated. The Weirton company has expended considerable sums in strip capacity at Weirton, and has developed new practice.

A grouping of important alloy steelmakers is now regarded as the first objective of Cyrus S. Eaton and his associates, of Cleveland.

The Donner Steel Co., which passed to control of Mr. Eaton and associates last week, is generally expected to find ultimate lodgment in the Central Alloy Steel Corp., of Massillon and Canton, O. It is reported that control of the Interstate Iron & Steel Co., of Chicago, is sought. Success of this program would give the Eaton associates alloy steel production at such lake shipping points as Buffalo and Chicago, and in northern Ohio.

Mr. Eaton, who last spring purchased about one-third of the common shares of the Bourne-Fuller Co., Cleveland, is expected to emerge shortly with control. Rumors also cast a nearby role for the Otis Steel Co. in merger plans.

Acquisition of Union Drawn Steel Co., Beaver Falls, Pa., by Republic Iron & Steel Co. is said to be nearer.

Operating Rates

Valley Unchanged, Chicago 88, Pittsburgh Off at 90

Youngstown, O.—Steelworks operations in the Valley continue practically unchanged from last week. Of the 51 independent open-hearth furnaces in the district, 45 were charged Sunday night, one less than a week ago. Pipe mill operations are unchanged, with 15 of 21 active. Independent bar mills have declined in output to about 50 per cent. Carnegie Steel Co. is around 80 per cent in this department. Independent sheetmakers are operating 112 of 120 units, unchanged. Strips mills continue at capacity and independent and Steel corporation tin mills are at 80 per cent. The Girard puddle mill remains at 60 per cent.

Chicago—A reduction of about two points has been made in the steel ingot output of the district. Output now is rated at about 88 per cent. Illinois Steel Co., in addition to a furnace banked and another taken out a week ago, has banked No. 3 furnace at South Chicago for several weeks. This leaves 17 of that producer's 27 furnaces active. Of the 36 blast furnaces in the district 26 are active. The ingot rate a year ago was 80 per cent. Bar and structural mills have been reduced to 80 to 85 per cent operations, while plate mills continue at capacity.

Pittsburgh—Steelmaking operations are off slightly at 90 per cent, with the greatest decrease being shown in schedules of independent producers. Finishing mill schedules show little change for the week. Sheet mills hold at 95 per cent, with tin plate operations slightly higher at 80 per cent. Strip mills are unchanged at 75 per cent, and pipe mills hold at 80 per cent for welded and 70 per cent for seamless.

Pig Iron

(*Concluded from Page* 745)

great extent for several years, placed close to 85,000 tons, mainly basic. The melt holds up well. Shipments in August probably were the heaviest on record for that month and the rate since Sept. 1 equals the August average. Sales in the past week totaled approximately 12,000 tons. St. Louis Gas & Coke Corp. booked 3600 tons, the largest lot being 2000 tons of foundry iron for a jobbing plant in the Chicago district. Prices are steady.

Philadelphia, Sept. 17.—The pig iron market is distinctly improved. Consumption is larger, causing an increase in specifications and new buying. Southern competition is more extensive, as more furnaces are soliciting business, but prices are somewhat higher than recently. The minimum done in the past week was $13.50, base, Birmingham, while some tonnage sold as high as $14.50. These prices are equivalent to $18.75 and $19.75, unloaded on Philadelphia docks. Eastern Pennsylvania foundry iron continues $21, base, furnace, for this district. Stocks are unusually small. Basic consumption is larger than anticipated and indications are considerable basic will be purchased next month. A large tonnage of low phosphorus also is expected to be purchased soon.

Cincinnati, Sept. 17.—Sustained buying of foundry pig iron for fourth quarter was noted in the Cincinnati district the past week, with orders for 8800 tons reported. This included 5600 tons of northern iron, one lot of 2500 tons going to a central Ohio consumer and 750 tons to Cincinnati. Northern iron prices are steady. A continued firm trend in southern iron was noted, dealers quoting $14 and $14.50, base, Birmingham. No conspicuous example of a concession from these prices on tonnage inquiries was available. A Dayton firm is inquiring for 350 tons of northern and the Louisville & Nashville railroad wants 351 tons.

Birmingham, Ala., Sept. 17.—More iron is being shipped from southern furnaces than is being manufactured, and there is an appreciable reduction of the surplus stock. Quotations are $14 to $14.50, base, Birmingham. Shipments will continue steady through the remainder of the year. It is not claimed that the greater portion of the surplus will be moved, though production will be held down. Only one blast furnace is scheduled to resume operation next month. More iron was shipped in August than in any month so far this year. The record will be exceeded in September.

Toronto, Ont., Sept. 17.—Canadian pig iron producers have opened books for fourth quarter and buying is developing on a substantial scale. Inquiries and specifications indicate heavy commitments will be made for the last three months of the year. Demand for spot delivery also is stronger. Prices are unchanged.

Scrap Dealers Assist in Compiling Costs

In an effort toward substituting facts for guesswork in the handling of scrap iron and steel, dealers of southern New England will compile records of costs in the handling and preparation of various kinds of scrap for the next few months, to be submitted to the Institute of Scrap Iron and Steel, New York, for analysis. This was the unanimous decision of members of the southern New England chapter at a meeting held last Sept. 11 at the Garde hotel, Hartford, Conn., attended by Benjamin Schwartz, director general of the institute.

It is expected that an analysis of costs for the first time in the history of the scrap iron industry will produce improvements in methods and indicate ways and means of eliminating losses in the purchase, handling and preparation of scrap. The results of the study by the institute will be submitted and discussed at future meetings of the chapter.

Union Steel Casting Co., Pittsburgh, is retiring its preferred stock.

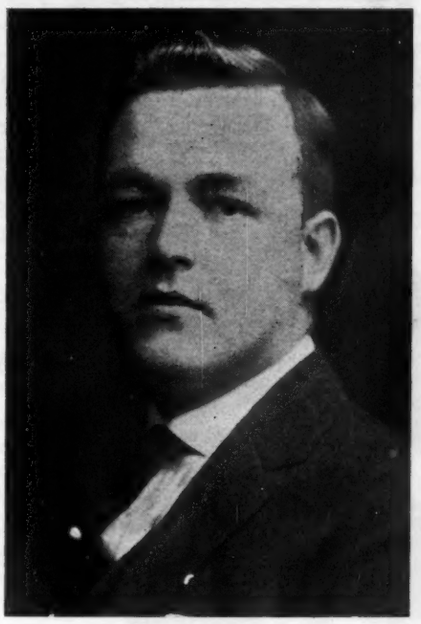
Industrial Men in the Day's News

Robert G. Guthrie, Presidential Nominee 1930, American Society for Steel Treating

ELECTION by mail ballot early in 1930 will follow action of nominating committee in Cleveland last week.

SPECIALIZING in high-power metallography, he has acquired nation-wide fame as a photomicrographist.

BECOMING identified with the Curtiss Aeroplane Co., Buffalo, in 1917, but transferring to the Peoples Gas Light & Coke Co., Chicago, five years ago, he has risen high in his chosen vocation.



NOMINATED for president of the American Society for Steel Treating in 1930 at the meeting of the nominating committee held Sept. 9 in Cleveland in connection with the eleventh annual National Metal Congress and Exposition, Robert G. Guthrie is hailed as the new chief of that body, since nomination virtually assures election. He will succeed Dr. Zay Jefferies, who has filled that office during 1929. Mr. Guthrie during 1929 has served as vice president of the organization.

Mr. Guthrie is chief metallurgist of the Peoples Gas Light & Coke Co., Chicago, but has spent much time on efforts in behalf of the Steel Treaters. He served on the board of directors of the society in 1925 and 1926 and also acted as chairman of the Chicago chapter in 1924 and 1925. He too was vice chairman of the Chicago convention committee in 1926.

Mr. Guthrie specializes in high-power metallography which he applies in his research work for many industrial consumers of gas in the Chicago district. He has, in fact, acquired a nation-wide reputation as a photomicrographist, having photographed specimens at record magnifications. On three separate occasions he broke the world's record for high-power work, holding the record for three consecutive years. In one attempt he succeeded in obtaining a plate of lamellar pearlite at 15,500 diameters.

Mr. Guthrie has been identified with iron and steel metallurgy during his entire business career. Although only 39 years of age, he has been signally successful in his chosen vocation. In 1917 he became identified with the Curtis Aeroplane Co., Buffalo, building for it one of the first large-scale microscopic laboratories for testing airplane parts and stresses. He has built many high-power cameras since that time and has contributed numerous articles to technical and professional journals, mostly dealing with metals. He became affiliated with the Peoples Gas Light & Coke Co., Chicago, approximately five years ago.

Recognition of his work was given by an eminent English scientist and on at least three occasions he was signally honored by King George of England.

J. H. ANDERSON, who formerly was connected with the Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., recently has been appointed foundry superintendent of the Litchfield Mfg. Co., Waterloo, Iowa. That company is reopening its foundry which has been idle for the past six years. Mr. Anderson prior to his association with the Mt. Vernon company, was foundry superintendent for the C. S. Bell Co., Hillsboro, O., which position he resigned to become general superintendent for the Root-Heath Mfg. Co., Plymouth, O. He also was

connected with Sweet & Doyle, Green Island, N. Y., with Stover Mfg. & Engine Co., Freeport, Ill., as foundry superintendent, and with the Traction Foundry & Machine Co., LaPorte, Ind., as general manager.

* * *

Frank Carter formerly United States government metallurgical inspector, has been placed in charge of the metallurgical department of the James H. Knapp Co., Los Angeles, manufacturer of industrial furnaces. Mr. Carter was graduated with the degree of B.Sc. in chemical engineering from Missouri State college, where he specialized in iron and steel metallurgy. He had several years' experience as

FRANK CARTER

governmental metallurgical inspector on aircraft engine parts. He had experience in the metallurgical laboratory of General Motors Corp. and later took charge of the metallurgical work on Liberty engine parts at the Nordyke-Marmon Co. plant, Indianapolis, including heat treating, routine hardness testing and tensile and impact tests for the metals used in the Marmon automobiles. He also was employed as metallurgist and heat treating specialist by the General Petroleum Corp.

* * *

Charles F. Glore was recently elected a director of the American Brake Shoe & Foundry Co., New York, to succeed George M. Judd, resigned. Mr. Judd continues as secretary.

* * *

Harry D. Fenske, manager of the transportation and export department, Great Lakes Steel Corp., Detroit, has been admitted to practice before the interstate commerce commission, under new regulations Sept. 1, which established a bar of the commission.

* * *

Elton Hoyt II has been elected vice president of the Interlake Steamship Co., Cleveland, succeeding the late H. S. Pickands. Henry G. Dalton is president of the company, which operates the largest independent fleet on the Great Lakes.

* * *

H. O. K. Meister has been appointed assistant general manager of the Hyatt Roller Bearing Co., Newark, N. J. He served as assistant general sales manager and later as general sales manager of the company at Newark since 1925. Prior to that he was manager of its western division in Chicago, having been associated with the company for more than 15 years.

* * *

G. Guy Jeter, with the transformer division of the General Electric Co., Pittsfield, Mass., has been made manager of the power apparatus sales division of the General Electric Supply Corp., Bridgeport, Conn. Mr. Jeter has been with the company for 19 years, going to Pittsfield from Schenectady, N. Y., in 1913. For six years he had been sales manager of the transformer accessory section.

* * *

E. Meyers now is foundry superintendent of the Milwaukee Grey Iron Foundry Co., Milwaukee, succeeding Fred Foote, now affiliated as foundry superintendent of the Prime Mfg. Co., Milwaukee.

B. D. Claffey, formerly connected with the Spring City Foundry Co., Waukesha, Wis., will on Oct. 1 become works manager of the Milwaukee Grey Iron Foundry Co. He has become financially interested in the company and will be in full charge of its foundry.

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Paul J. Kruesi, vice president of the East Tennessee Iron & Coal Co., Knoxville, Tenn., for 10 years, has been elected president to succeed the late Senator L. D. Tyson.

Charles A. Raht of Chattanooga, Tenn., succeeds Mr. Kruesi as vice president.

Lawrence T. Lee, a nephew of the senator, was elected a director to succeed his uncle and E. Y. Chapin of Chattanooga, was elected director to fill a vacancy caused by the death of L. W. Llewellyn.

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W. S. Rugg, vice president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was recently appointed to serve on the Edison medal award committee of the American Institute of Electrical Engineers, of which Samuel Insull of Chicago is chairman. Other members are L. W. W. Morrow, editor of *Electrical World* and R. F. Schuchardt of the Commonwealth Edison Co.

The medal is awarded for "meritorious achievements in electrical science, engineering or arts." The 1929 medal will be awarded sometime in December.

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William B. Joyce, chairman of the National Security Co., New York; Charles S. McCain, president of the Chase National bank, New York;

L. E. GRIFFITH

Who as noted in IRON TRADE REVIEW of Sept. 5, was recently elected vice president and director of the Riley Stoker Corp., Worcester, Mass.

William H. Miner, of the W. H. Miner Ink Co., Chicago; Thomas I. Parkinson, president of the Equitable Life Assurance Co., New York, and Donald Symington, president of the Baltimore Trust Co., Baltimore, have been elected directors of the Western Electric Co., Chicago.

* * *

A. W. Thompson, formerly president of the Philadelphia Co., Pittsburgh, and later president of the United Gas Improvement Co., Philapedphia, from which he retired on account of ill health, has been elected chairman of the board of directors of the McKinney Mfg. Co., Pittsburgh, hardware manufacturers.

J. P. McKinney Jr., who had been vice president, has been elected president to succeed W. C. Farr, who re-

tains his place as treasurer and has been made secretary. Other officials are unchanged.

The McKinney board of directors now consists of Mr. Thompson, J. P. McKinney Jr., W. C. Farr, R. G. McKinney, W. S. McKinney, R. L. McKinney and W. C. Fownes Jr.

* * *

O. G. Neumann, for 10 years with the Jones & Laughlin Steel Corp., Pittsburgh, at one time as assistant manager of the Cincinnati warehouse but more recently handling both mill and warehouse sales in Indiana, has become associated with the sales department of the Inland Steel Co., Chicago. His headquarters will be the company's general offices at Chicago but he will cover parts of Indiana and Michigan. Prior to his Jones & Laughlin connection he was with the Scully Steel & Iron Co.

* * *

James A. Campbell, president of the Youngstown Sheet & Tube Co., Youngstown, O., was tendered a testimonial dinner by more than 300 of his personal friends at the Ohio hotel, that city, Sept. 11. The occasion was the celebration of his seventy-fifth birthday. He received numerous congratulatory messages, engraved congratulations being presented by employes of Campbell and Brier Hill works, the latter engraved on steel. Among the many telegrams received was the following from President Herbert Hoover: "Permit me to join with your other friends in extending to you heartiest congratulations upon your seventy-fifth birthday." Many personal tributes were read and presented at the gathering. As noted in a complete biographical sketch published in the Sept. 12 issue of IRON TRADE REVIEW, Mr. Campbell has been identified with the Youngstown company since 1901.

Directory of Exhibitors and Exhibits

(*Concluded from Page* 724)

nue, Cleveland.—Portable air drills, grinders, sanders and buffers.

RYERSON & SON INC., JOSEPH T., Sixteenth and Rockwell streets, Chicago.—No. 3, 4 and 7 Ryerson combination shear punch and coper for punching, shearing, coping and notching structural shapers, plates, bars, etc.; 800-ampere Wilson arc welder in operation in a glass booth; No. 2 Ryerson serpentine shear for cutting irregular shapes from sheet steel; Ryerson flue cutter and polisher and Ryerson flue roller (both machines used in the reclamation of locomotive flues by the butt welding process); Ryerson No. 0 high speed friction saw for cutting light metal shapes, moldings, etc.; Ryerson No. 0 high speed friction saw with rotating cutting attachment.

SAFETY GRINDING WHEEL & MACHINE CO., Springfield, O.—Heavy portable grinder (change speeds); change speed—Alternating current motor drive "Rite Speed" floor grinders; conventional type motor driven floor grinders; grinding wheels for every purpose.

SEBASTIAN LATHE CO., Covington, Ky.—20-inch semiautomatic production lathe; 15-inch motor driven lathes; 11-inch motor driven lathe; 11-inch high speed production lathe.

SELLERS & CO., WM., Philadelphia.—No. 2A drill grinder, capacity 5/16 to 3-inch in diameter; drill point thinning machine, capacity ½ to 3-inch; No. 1A tool grinding and shaping machine, capacity up to 3 x 3-inch; No. 2 tool grinding and shaping machine, capacity up to 1½ to 2-inch; No. 1 hob and cutter grinder for sharpening straight and spiral gashed hobs up to 12-inch long 12-inch diameter, reamers, taps, milling cutters, etc.

SENECA FALLS MACHINE CO., Seneca Falls, N. Y.—Seneca Falls turning equipment; "Lo-Swing" lathes; semiautomatic lathe; full automatic lathes; "Short-Cut" production lathes.

SIDNEY MACHINE TOOL CO., Sidney, O.—22-inch x 12-foot Monotrol engine lathe; 161 inch x 6-foot Monotrol toolroom lathe; 18-inch x 8-foot Tritol lathe; open Monotrol geared headstock.

SIEWEK TOOL & DIE CO., 10233 Woodward avenue, Detroit.—Tools and dies.

SIMONDS SAW AND STEEL CO., 470 Main street, Fitchburg, Mass.—Circular and band saws for cutting metal; files; "Red Streak" hack saws; "Abrasive" grinding wheels.

S K F INDUSTRIES INC., 40 East Thirty-fourth street, New York.—Ball and roller bearings for machine tools.

SKINNER CHUCK CO., New Britain, Conn.—Lathe chucks of various sizes and weights; face plate jaws; drill press vises; milling machine vises; drill chuck; air chucks.

SLEEPER & HARTLEY INC., Worcester, Mass.—No. 2 Universal spring coiling machine with wire reel.

SMITH & MILLS CO., Cincinnati.—One 25-inch back geared heavy duty crank shaper constant speed motor drive complete with 7½-horsepower motor; one 12-inch single geared crank shaper constant speed motor drive complete with 2-horsepower motor.

SPRINGFIELD MACHINE TOOL CO., Springfield, O.—14-inch x 6-foot quick change geared head engine lathe; belted M.D. in leg, with taper attachment, Timken bearings, draw-in collet attachment with collets; 18-inch x 8-foot quick change geared head engine lathe, belted M. D. in leg, taper attachment, oil pan, Timken bearings and turret tool post; machine for removing gear teeth from flywheels.

STANDARD ELECTRICAL TOOL CO., 1938 West Eighth street, Cincinnati.—Portable electric drills; electric driven grinders; electric driven buffers; polishing machines.

STANDARD STEEL SPECIALTY CO., Beaver Falls, Pa.—Machine keys; Woodruff keys; machine rack; taper pins; elevator guides; special milled sections.

STANDARD TOOL CO., 6918 Central avenue, Cleveland—Twist drills; reamers; taps; milling cutters; drill chucks.

STARK TOOL CO., Waltham, Mass.—Stark precision lathes; bench milling machine; motor drive unit.

STARRETT CO., L. S., Athol, Mass.—Mechanical tools; gages; micrometers; indicators; rules; squares; hack saws; steel tapes.

STOCKBRIDGE MACHINE CO., Abbott street, P. O. Box 44, Worcester, Mass.—Barrett centrifugal oil extractor, model 1200; centrifugal dryer, model 502; centrifugal washer, model 251; Stockbridge heavy duty back-geared shaper with two-piece crank.

STUART OIL CO., D. A., 2733 South Troy street, Chicago—Stuart's "Thread-Kut" alloy steel cutting oil; "Super-Kool" light colored heavy sulphur base oil; "Godol" liquid grinding compound; "Kleen-Kut" soluble oil; "Drawsol" deep drawing compound; No. 34 soluble quenching oil.

SUNDSTRAND MACHINE TOOL CO., Rockford, Ill.—No. 40 Rigidmil; No. 33 Rigidmil; No. 22 Rigidmil; No. 3 Rigidmil; 8-inch brake drum lathe; 15-inch automatic stub lathe; 4 x 24-inch centering machine.

SUN OIL CO., Philadelphia.—Emulsifying and straight cutting oils; machines demonstrating cutting oils; machined parts.

SUPERIOR MACHINE TOOL CO., Kokomo, Ind.—Superior type M-10-inch bench drill, motor driven; type B-20-inch floor drill, motor driven; type HD-25-inch floor drill.

SWIFT WELDER CO., Kenton, O.—36-inch Super-Dreadnaught shaper; 24-inch dreadnaught shaper; Swift No. 35 flue welder; No. 6 combination copper and steel welder; No. 12 automatic welder; No. 16 projection welder.

TAFT-PEIRCE MFG. CO., Woonsocket, R. I.—Adjustable reamers; angle irons; box parallels; boring tool holders; contract service; plug, ring, snap and thread gages; parallels; production and inspection tools; sine bars; Superpower magnetic chucks; surface plates; thread milling machine; toolmakers' knees; V blocks.

TAYLOR & FENN CO., Hartford, Conn.—Two spindle horizontal spline milling machine; high speed vertical milling machine; two spindle drilling machine with built-in motors on the head; four spindle drilling machine; No. 0 spring press; No. 00 spring press; No. 12 motor driven spring press.

THOMPSON GRINDER CO., Springfield, O.—Thompson 12 x 36-inch self-contained motor driven Universal grinding machine.

TIMKEN ROLLER BEARING CO., Canton, O.—Timken tapered roller bearings.

TITEFLEX METAL HOSE CO., 500 Frelinghuysen avenue, Newark, N. J.—"Titeflex" all-metal flexible tubing, for the carrying of lubricants and cutting compounds.

TORRINGTON CO., Torrington, Conn.—Three sizes of Dayton-Torrington swaging machines; Torrington ball bearings.

TUTHILL PUMP CO., 131 West Sixty-third street, Chicago.—No. 1R reversing pump for handling coolant; No. 6M motor driven pump for handling coolant; No. 2M motor driven pump for handling coolant; OB motor driven pump for lubricating or hydraulic service; No. 6C tight and loose pulley drive pump for handling quenching oil; No. 2MS pump unmounted; No. 2CS pump unmounted; Tuthill high-pressure pump for hydraulic service.

TWIN DISC CLUTCH CO., Racine, Wis.—Dry plate type clutches; multiple disc clutches designed to operate in bath of oil.

UNION MFG. CO., New Britain, Conn.—Lathe chucks; boring mill chucks; planer chucks; drill chucks; face plate jaws; boring mill jaws; chain hoists.

UNITED STATES ELECTRICAL TOOL CO., 2488 West Sixth street, Cincinnati.—Electric direct connected grinders and buffers; electric lathe grinders; portable grinders; drills.

UNIVERSAL BORING MACHINE CO., Hudson, Mass.—No. 40 Triway Universal horizontal boring machine; Hanson measuring attachment.

VAN DORN ELECTRIC TOOL CO., 3000 Woodhill road, Cleveland.—Portable electric drills; screw drivers; tappers; nut setters; reamers; portable and stationary polishers; grinders; buffers; drilling and grinding stands, bench type portable electric hammers; portable automatic heat control glue heaters; electric valve refacers; valve reseating cutters; portable disc sanders; portable electric socket wrench; high frequency portable tools.

VAN NORMAN MACHINE TOOL CO., 150 Wilbraham avenue, Springfield, Mass.—No. 10 Van Norman Duplex miller, motor driven, with worm index centers and high speed spindle; No. 3 Duplex miller, motor driven, with 10-inch full Universal centers, sub-head, and Universal slotting attachment; No. 25 oscillating grinder, motor driven, with full ball bearing work heads, special chucking device and water equipment.

WALKER CO., INC., O. S., Worcester, Mass.—Single stroke surface grinding machine; magnetic chucks.

WARNER & SWASEY CO., Cleveland.—No. 5-A and 1-A Universal hollow hexagon turret lathes in operation on actual work; No. 5 and No. 4 Universal turret lathes.

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa.—Motor starters; motors; gears; belt drive (cog belt); controllers for motors; electric welders.

WHITNEY MFG. CO., 237 Hamilton street, Hartford, Conn.—Chains and sprockets for power transmission.

WHITNEY METAL TOOL CO., Rockford, Ill.—Ball bearing metal punches; lever type metal punches; deep throat metal punches; angle iron machinery; notcher; benders; shears; awls; hammers; rivet sets.

WILLIAMS TOOL CORP., Erie, Pa.—6-inch Williams "Rapiduction" pipe threading machine; 2-inch double spindle bolt threader; 2-inch portable pipe threading machine; 4-inch "Wilco" pipe threading machine.

WISCONSIN ELECTRIC CO., Racine, Wis.—No. 5 grinder with attachments A, B and C; No. 3 grinder, Tl, shop utility tool; No. 2-AG grinder drills; No. 1 grinder motors.

YALE & TOWNE MFG. CO., Stamford, Conn.—Yale chain blocks, trolleys, cranes, electric hoists, motor driven trolleys, electrical industrial trucks, hardware, locks.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

BUCYRUS-ERIE CO., South Milwaukee, Wis., formed by a union of the Bucyrus Co. and the Erie Shovel Co., has completed acquiring Ruston & Hornsby Ltd., of Lincoln, Eng., an established English concern. Ruston-Bucyrus Ltd. is being formed to represent the company in England. Each of the component companies will hold equal stock in the company. W. W. Coleman, president of the Bucyrus-Erie Co., will be chairman of the board.

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AIR-WAY ELECTRIC APPLIANCE CORP., Toledo, O., has bought the Erie Heating System Inc., Erie, Pa., and will remove it to its Toledo plant.

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RAMISCH TOOL & DIE CO., 1906 Reed street, Kalamazoo, Mich., has its new plant in partial operation and is installing further equipment. C. T. Ramisch is president.

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ARDENT FURNACE CO., Blanchester, O., will start production shortly in its new plant, in which it will build its new type of furnace designed to minimize smoke emission.

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STANDARD LOCOMOTIVE EQUIPMENT CO., 1819 Clinton street, Toledo, O., is completing its first unit, which is expected to be occupied by Oct. 15.

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LUDLUM STEEL CO. has moved its representation at Cleveland from 5140 Superior avenue to 1593 East Forty-first street. T. C. Sherman is manager of the alloy division and W. H. White of the tool steel division.

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STANLEY IRON WORKS, Minneapolis, manufacturer of light steel fabrications, steel stairways and fire escapes, bronze and interior wrought iron, has occupied an addition to its plant which increases its capacity 50 per cent.

* * *

INCA MFG. CO., Fort Wayne, Ind., which will manufacture wire for the electrical and allied trades, will have its new plant ready for machinery Oct. 1 and production shortly after. The first unit is 200 by 300 feet, of brick and steel construction. Wendell C. Glass, vice president in charge of production, will be in charge of plant operations. George A. Jacobs, former president of the Dudlo Mfg. Co., is president and general manager.

* * *

WILLIAMS FOUNDRY & MACHINE CO., division of the National-Erie Co., Erie, Pa., manufacturer of rubber machinery and repair equipment, has completed its new plant at Erie, which will give much enlarged production.

* * *

GLOBE MACHINERY & SUPPLY CO., Des Moines, Iowa, manufacturer of automobile hoists, has completed a new plant, one story, with 20,000 square feet of floor space. Greatly enlarged production will be made possible by this addition.

* * *

DUFF-NORTON MFG. CO., Pittsburgh, plans to move the plant of the A. O. Norton Corp. from Moline Ill., to the main plant at Pittsburgh. The company was formed about a year ago by merger of the Duff Mfg. Co., Pittsburgh, and the A. O. Norton Corp., Moline, Ill.

* * *

WESTERN ELECTRIC CO., Chicago, has contracted for a five-year period with the Consolidated Gas, Electric Light & Power Co., Baltimore, for all its electric power and steam requirements at its new plant now under construction at Point Breeze, Md.

* * *

YOUNGSTOWN STEEL CAR DOOR CO., Wickliffe, O., will take possession of its new plant shortly and start production. It will require about 30,000 tons of steel plates annually for its production. It is controlled by interests affiliated with Youngstown Sheet & Tube Co., headed by James A. Campbell.

* * *

GOETZ-VOSS CORP., Milwaukee, has been organized with an initial capital of $50,000 by John Goetz, for many years associated with the Kempsmith Mfg. Co., maker of milling machines, and Arthur E. Voss, to act as consulting engineer in the designing and production of special machinery and fixtures. A toolroom and machine shop has been erected at 430 State street, Wauwatosa, a suburb of Milwaukee, and is now in operation. Mr. Goetz, who retired some time ago as vice president and works manager of the Kempsmith company, has been connected with the machinery business since his youth, and will direct engineering and production activities. Mr. Voss, executive in a unmber of Milwaukee corporations, will be active as administrative head.

* * *

MILWAUKEE ELECTRIC RAILWAY & LIGHT CO., Milwaukee, is about to begin excavation for a $4,200,000 addition to the Lakeside steam generating plant near Cudahy, Wis., which is said to be the largest plant in the world employing powdered coal and high pressure boilers. The equipment will consist of a 60,000-kilowatt low pressure turbo-generator and two 7700-kilowatt high pressure turbo-generators. The boiler proper will be 75 feet high, and generate 1309 pounds of steam to the square inch, compared with the ordinary 300 pounds. It will operate both the low and high pressure turbines and develop electrical energy equivalent to 40,000 horsepower. John Anderson is vice president in charge of power.

* * *

KEYSTONE DRAWN STEEL CO., Spring City, Pa., is about to install new equipment which will substantially triple its present capacity for ground shafting. Improvements will include a new building, 40 x 200 feet. In addition, the bar storage department will be enlarged, and the crane runway extended to provide for a larger supply of hot rolled bars. Provision also is being made for adequate storage of highly finished product whose surface must be kept bright. The company was organized in October, 1925. Officers are: President, W. N. Lynch; vice president and general manager, J. J. Komara; vice president and general sales manager, A. J. Kinnucan.

* * *

WEAN ENGINEERING CO., Warren, O., has received an order for all of the pack heating furnaces for the Newton Steel Co.'s new Monroe,

Mich., plant. These will be of the radiant-gap type. More than 55 will be in use when completed.

* * *

WELLMAN BRONZE CO., Cleveland, has completed installation of a modern chrome plating plant for finishing its product with chromium.

* * *

ACTIVE MACHINE & TOOL CO., 1220 West Sixth street, Cleveland, has changed its name to Tools & Gages Inc.

* * *

WRIGHT & CORSON CO., Milford, Conn., manufacturer of rivets and automatic rivet-setting machines, now occupies a new factory on the Bridgeport turnpike, moving here from Bridgeport.

* * *

HEMMING BROS. CO. INC., New Haven Conn., has been reorganized under the name of the Sta-Brit Cutlery Co. The officers are Carl H. Hemming, president; Ralph E. Herman, vice president, and Edward J. Brennan, secretary.

* * *

LITCHFIELD MFG. CO., Waterloo, Iowa, has opened its foundry, which has been closed since 1923. It contains 32,000 square feet of floor space. Two cupolas will be operated with a daily production of about four tons.

* * *

GULF PRODUCTION CO., Orange, Tex., has contracted with Gulf States Utilities Co. for electric power in southwestern Orange county oil fields, including drilling. The latter is building a high voltage line to the field from Orange.

* * *

COCKRELL-McILROY CO., Amarillo, Tex., plans construction of a two-unit southwestern type gasoline plant near Clayton, Tex., with capacity of 20,000,000 feet a day. Engine compressor equipment has been ordered from Clark Bros. Co.

* * *

SIPP MACHINE CO. and Benjamin Eastwood Co., two of the oldest textile machinery manufacturing firms at Paterson, N. J., have incorporated under the name of Sipp-Eastwood Co. Officers of the two companies will remain active in the consolidated business.

* * *

KOPPEL INDUSTRIAL CAR & EQUIPMENT CO., Koppel, Pa., subsidiary of the Pressed Steel Car Co., reports August the best month in its history. The company recently was awarded contracts for the construction of 104 air dump cars for Sir John Jackson, to be used on admiralty docks in Singapore, China; 540 mine cars for the Buckeye Coal Co., eight 70-ton air dump cars for the Pittsburgh & Lake Erie railroad, four for the Youngstown Sheet & Tube Co., and 10 each for Guthrie & Co. and Butler Bros., St. Paul.

* * *

CHENEY BIGELOW WIRE WORKS, Springfield, Mass., is installing new machinery and increasing production in the department devoted to elevator enclosures, window guards and wrought iron grill work. Volume thus far this year is reported close to 18 per cent ahead of 1928.

* * *

TRACTION FOUNDRY & MACHINE CO., Laporte, Ind., recently organized, will be in production by Oct. 1. K. H. Kluck is founder of the company. Gray iron and semisteel castings will be produced. The plant has been equipped with entirely new machinery.

* * *

CAMBEC TOOL & STAMPING CO. has been moved to Springfield, Mass., from Attleboro, Mass., by William Cloutier. A new corporation will be organized. The company will engage in machine and tool work and metal stamping. The company has also manufactured fire extinguishers at Attleboro.

* * *

MUELLER CO., Decatur, Ill., manufacturer of plumbing and heating specialties and supplies, has started construction of a branch factory at Atlanta, Ga., to supply the southeastern states. The plant will include a foundry and machine shop and cast iron water pipe will be the principal product.

* * *

ADAMS FOUNDRY CO., Philadelphia, has been formed to succeed the William Adams Foundry Co., which has been in existence more than 50 years. The company will not operate a foundry but will buy its castings. The company will handle specialties, special castings, patterns and machine work.

* * *

CAROLINA MOTOR PARTS CO., 200 North College street, Charlotte, N. C., has engaged in the distribution of automobile parts and garage machinery and tools. The company, recently organized, is composed of E. M. Branch and M. H. Fraser, both formerly with the Genuine Parts Co., Atlanta, Ga.

* * *

DIAMOND CHAIN & MFG. CO., Indianapolis, Ind., has completed its plant extension and new office building. The latter is four stories, of concrete fireproof construction. It houses the engineering and drafting departments in addition to offices. The addition gives 40,000 square feet floor space more than previously.

* * *

CITY FORGE CO., Toledo, O., has been formed to take over the forge property, equipment and business of the S. M. Jones Co. Manufacture of the same products will be continued in the same plant. The personnel will be unchanged under the management of G. A. Strubb. The entire capital of the new company is owned by the City Machine & Tool Co., Toledo.

* * *

PHILLIPS BROTHERS, 34 South Seventeenth street, Philadelphia, with warehouse at Thirty-first and Jefferson streets, have been appointed sales agents for the Gulf States Steel Co. in Eastern Pennsylvania, Southern New Jersey, Delaware and Maryland. The products include steel bars, angles, channels, billets, blooms, nails and wire.

* * *

SAGINAW FOUNDRIES CO., Saginaw, Mich., recently formed by Fred W. Stork with $200,000 capital, will take over the plant and business of the A. F. Bartlett Co., 930 South Water street, Saginaw. Gray iron castings will be made and a steel foundry department will be added before Jan. 1. Mr. Stork is in charge of the plant's operation.

* * *

NOMA ELECTRIC CORP. and Pilot Radio Tube Co. have purchased the New England Wire Co., Westfield, Mass., the latter plant having a capacity of 200,000,000 feet of fine and specialty steel wire annually. Noma Electric Corp. recently purchased the Everett Mills at Lawrence, Mass., and removal of the wire plant to the Lawrence factory is contemplated.

* * *

DUDLO MFG. CO., Fort Wayne, Ind., is occupying an addition to its plant. The company manufactures wire for electrical and similar trades. Three-fourths of the new addition will be used for manufacturing purposes and the remainder for shipping and warehouse facilities. When the new structure is completely occupied, more than 112,000 square feet of floor space will be added. Eventually the factory forces now at work at the Murray street branch will be moved to the main factory buildings. Equipment for a new boiler house and heating plant of the company, which will be completed in November, will cost about $125,000 and will include boilers, a treatment plant for water, stokers and coal handling equipment.

Welding Society Reviews and Studies Trends

(*Concluded from Page* 730)

view the progress of research being conducted by the various committees. W. Spraragen, secretary of the bureau, in a few brief remarks defined the meaning of the organization and its relation to the society. The bureau, he said, functions largely through the research committees of the parent organization.

The rail joint committee has for its purpose the improving of various types of joints used by street railway companies. A sum of $24,000, of which $10,000 was contributed by the American Electric Railway association, was raised to carry out the program of the committee. The bureau of standards and a half dozen college laboratories are co-operating. Six progress reports have been prepared and only a few problems of the original program are left, Mr. Spraragen said. This progress report is nearly 500 pages in length.

Following the discussion of this committee, he turned to the structural steel welding committee which he stated also is very active. A total of $22 500 already has been pledged to carry out the work. The first task undertaken by the committee was to review existing literature on this phase of welding and prepare a summary. This was done by a group headed by President Llewellyn. Another group considered the exact welding procedure and technique of making up specimens to be tested. Pilot tests preceded the regular program work.

Nitriding Session Holds Greatest Interest

(*Concluded from Page* 728)

time case hardening is giving way to another method of hardening.

The second paper was by H. W. McQuaid and W. J. Ketchum, Timken-Detroit Axle Co., Detroit. This paper viewed the subject from the user's standpoint. Axles, Mr. McQuaid said, require better material than can be case hardened. His conclusion is that steel can be nitrided to a condition superior to a case hardened product and the quality is better in all respects except machinability. He believes that even at the higher price per unit for nitrided material compared with case hardened, elimination of losses from warping, grinding cracks and similar defects make the finished units not much more expensive. Plain carbon bars were used in these experiments and a surface fully as hard as case hardened was obtained but only 0.001-inch deep. Low-carbon sorbitic steel gives a higher hardness than obtained by case hardening. There is need for larger furnaces to accommodate large parts, such as crankshafts and similar parts. Recovery of ammonia after use is a feature to be worked out to reduce cost.

A. B. Kinzel announced development of a new etching reagent by one of his associates, which is believed superior to others for use with nitrided steel. It is composed of absolute alcohol, water, copper, sulphate and copper chloride in acidulated solution. This reagent will be the subject of a paper at an early date.

Discussion brought out the general opinion of need for co-ordinated effort and of repeated tests to prove results and demonstrate the soundness of conclusions from experiments. Quality of steel offered for the nitriding process was suggested as one need, as some parts given laboratory tests for consumers lacked good results because the steel was unsuited to the process and failed to respond.

Contractors Sue Unions for Heavy Damages

Suit for $350,000 damages has been filed in common pleas court, Cleveland, by the Building Trades Employers association of that city, the Lundoff-Bicknell Co., and J. H. Libby Co., contractors, against the two locals of the International Union of Steam and Operating Engineers. The action bears a resemblance to the famous Danbury hatters case, as the contractors are attempting to hold the officers and members of the union responsible for damages incurred through alleged violation of contract. In this case, the contractors were engaged on a $3,000,000 job in connection with the new union terminal development, and claimed to have an agreement with the locals providing for arbitration of any dispute, other than jurisdictional.

The employes quit without notice, it is alleged, piling up heavy penalties against the contractors who were unable to proceed with the work. Local union representatives say the walkout was ordered by the international president who lives in Boston. There was no trouble on this job, and the only explanation forthcoming was that the walkout was in retaliation for difficulties with the union in Chicago.

Obituaries

RICHARD H. VERIAN, 74, president of the Enterprise Foundry Co., Rochester, N. Y., died in his home in that city. He had been head of the company for near half a century.

* * *

W. D. Lee, 67, steel construction engineer and contractor, died recently at his home in New Orleans, La. Mr. Lee had been in charge of the construction of bridges in various parts of the country, including important bridge work in the Chicago district.

* * *

Ray P. McGrath, for 15 years manager of the San Francisco office of the Sullivan Machinery Co., Chicago, died Aug. 25. He had been associated with the company since 1906, having been prior to 1914 identified with the New England sales office at Boston.

* * *

Edwin Lewis Edes, 76, a son of Oliver Edes, founder of one of the earliest zinc rolling mills in the United States, died at his summer home in Plymouth, Mass., Sept. 3. He early became affiliated with his father's business, but after the latter's death he continued the business as sole proprietor. In 1893 he organized the Edes Mfg. Co. to continue the zinc rolling and zinc engraving plate manufacturing business. His son, Alton D. Edes, is vice president.

* * *

Hiram M. Davis, 77, pioneer of the electroplating industry in Milwaukee, died at his home in that city, Sept. 10. He was born at Mount Morris, N. Y., but located in Milwaukee in 1870. He established a plating shop in 1875, a few years after the invention of the process. In 1912 the business was taken over by his son-in-law, S. K. Williams, who has since operated it as S. K. Williams & Co., with plant and offices at 850 Thirty-second street.

* * *

Claude V. Marks, secretary, treasurer and director of the Ohio Brass Co., Mansfield, and Barberton, O., and Niagara Falls, Ont., manufacturer of electric railroad equipment, automobile parts, etc., disappeared Sept. 9 from the steamer HOMERIC on which he was traveling to Europe in company with President C. K. King. Company and steamer officials expressed the belief that in some accidental way he fell overboard, since a thorough search of the ship failed to locate him. Mr. Marks also was secretary, treasurer and director of the Ohio Insulator Co. and the Canadian Ohio Brass Co. Ltd.

British Pig Iron Market Stronger

Price Advance Forecast in Some Districts—Trade with South Africa Affected by Increase in Freight Rates—Continental Market Quiet

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Sept. 17.—(*By Cable*)—An increase in Midland pig iron prices is forecast, one reason being the scarcity of coke. Demand for foundry iron is brisk, due to renewed activity in building construction. Makers of East Coast hematite also seek higher prices. Continental steel competition is restricted, buyers not being anxious to close because of price uncertainty. Railroad orders are scarce. Shipments of tin plate and galvanized sheets to South Africa continue large, owing to the coming freight rate increase. Producers fear the trade with South Africa will be affected permanently.

A report from Brussels states Belgian iron and steel markets are dull, and prices generally steady, except bars and wire. Quieter conditions also are reported in German markets, except for fairly active demand for plates and sheets. Prices are easier, and some works are reducing operations. A report from Paris says the French export markets are quiet, domestic shipments continuing satisfactory.

Production of pig iron in Great Britain amounted to 682,000 tons in August, compared with 670,000 tons in July and 657,800 tons in June. The number of furnaces in blast Sept. 1 was 170, three more than Aug. 1. Steel output in August totaled 753,300 tons, against 800,000 tons produced in the month of July and 830,900 tons aggregating the output in June.

British Markets Sound, Though Buying Is Light

BIRMINGHAM, Eng., Sept. 6.—The iron and steel markets have not altogether shaken off the holiday feelings which prevailed through August, and while there are signs of renewed interest in all directions, large scale buying still is being postponed. The pig iron position at Birmingham is sound. The central pig iron producers' association held another meeting last week following rumors that an advance was meditated, but it was decided to leave prices alone, a decision received with much relief on all hands. It is feared, however, that makers will not

Sterling $4.85

be satisfied with present prices for very long as the continued increase in coke values is a matter of serious concern when it is remembered that about a ton and a half of coke is needed to smelt a ton of pig iron. The minimum price for good blast furnace fuel is 16s 6d ($3.99) at the ovens, and where prompt lots can be bought smelters have to pay premiums. With the winter months ahead the demand for small coking coals is bound to expand for purposes of heating apparatus, so that the prospects of relief in the coke position are discouraging.

Inquiries are on an improved scale in the Middlesbrough market and there is little Middlesbrough pig available for early delivery. Prices are firm, No. 3 G. M. B. being quoted by makers and merchants at £3 12s 6d ($17.57) a ton. Manufacturers of hematite are pressing strongly for more remunerative selling prices, but are dissatisfied with the progress so far made.

Structural steel in the Midlands is

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, September 16	British Gross Tons U. K. Ports		French Metric Tons Channel Ports		Belgium and Luxemburg Metric Tons Channel Ports		German Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON	£ s d		£ s d		£ s d		£ s d	
Foundry No. 3, Silicon 2.50-3.00	$17.58	3 12 6*	$17.46	3 12 0	$17.46	3 12 0	$17.46	3 12 0
Basic	16.61	3 8 6	17.22	3 11 0	17.22	3 11 0	16.73	3 9 0
Basic-bessemer	18.43	3 16 0†	17.22	3 11 0	17.22	3 11 0	16.73	3 9 0
Hematite, Phosphorus 0.02-0.05	18.43	3 16 0	24.63	630*	.....	.....	17.70	3 13 0
SEMIFINISHED STEEL								
Billets	$30.92	6 7 6	$23.28	4 16 0	$23.28	4 16 0	$23.28	4 16 0
Wire rods	41.23	8 10 0	30.92	6 7 6	30.92	6 7 6	30.31	6 5 0
FINISHED STEEL								
Standard rails	$40.01	8 5 0	$31.53	6 10 0	$31.53	6 10 0	$31.53	6 10 0
Merchant bars	1.79c	8 5 0	1.22c	5 11 0	1.22c	5 11 0	1.26c	5 14 6
Structural shapes	1.60c	7 7 6	1.12c	5 2 0	1.12c	5 2 0	1.14c	5 4 0
Plates, ship, bridge and tank	1.76c	8 2 6	1.38c	6 5 0	1.38c	6 5 0	1.38c	6 6 0
Sheets, black, 24 gage	2.17c	10 0 0	2.42c	11 0 0	2.42c	11 0 0	2.33c	10 12 0
Sheets, galvanized, 24 gage, corrugated	2.90c	13 7 6	2.93c	13 6 3	2.93c	13 6 3	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.28c	5 16 0	1.28c	5 16 0	1.29c	5 17 0
Plain wire, base	2.06c	9 10 0	1.65c	7 10 0	1.65c	7 10 0	1.65c	7 10 0
Galvanized wire, base	3.04c	14 0 0	2.12c	9 12 6	2.12c	9 12 6	2.09c	9 10 0
Wire nails, base	2.39c	11 0 0	1.76c	8 0 0	1.76c	8 0 0	1.79c	8 3 0
Tin plate, base box 108 pounds	$ 4.49	0 18 6	.....	.....	.....	.....	$ 8.97	1 17 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$17.58	3 12 6	$18.57	475(2)	$17.24	620	$20.23	85
Basic pig iron	16.61	3 8 6	19.94	510(1)	17.38	625	21.66	91
Furnace coke	4.00	0 16 6	6.26	160	5.84	210	5.12	21.50
Billets	31.53	6 10 0	24.24	620	24.46	880	28.80	121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1,250	1.51c	140
Merchant bars	1.79c	8 5 0	1.34c	745	1.32c	1,015	1.52c	141
Shapes	1.76c	8 2 6	1.26c	700	1.22c	940	1.49c	138
Plates, ship, bridge and tank	1.93c	8 17 6‡	1.46c	810	1.48c	1,140	1.71c	158
Sheets, black, 24-gage	2.28c	10 10 0	2.87c	1,595	2.54c	1,950	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.90c	13 7 6	3.68c	2,045	3.58c	2,750	3.78c	350
Plain wire	2.06c	9 10 0	1.94c	1,075	2.15c	1,650	2.48c	230
Bands and Strips	2.17c	10 0 0	1.49c	830	1.56c	1,200	1.77c	164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy, British export furnace coke £0 16s 6d ($4.00) f. o. b. Ferromanganese £21 13s. 0d ($105.00) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.75) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

definitely improving in demand and some of the Black Country yards are fully employed. The building awards are mostly small, but in the aggregate a substantial tonnage of sections, bars, etc., are being brought from the rolling mills of the Middlesbrough district. There has been very little change in the price of structural steel this year and the market has undoubtedly been helped in this way. The manufacturers continue the rebate scheme which is obviously working satisfactorily in its efforts to curtail, at any rate, the use of foreign steel. One Birmingham firm which uses large quantities of Middlesbrough steel complains strongly of the inability to obtain reasonable delivery.

Birmingham merchants selling Continental material are cutting prices a good deal in an endeavor to capture business, but consumers in many cases are not to be drawn by the low offers circulating for continental steel. An offer from a Belgian works of tube strip at £7 ($33.95) a ton has been turned down this week, though this is 5s ($1.21) below the usual price of this material.

There is no indication of which way the market will turn and with some products still falling consumers prefer to wait before placing business. No. 3 iron bars from Belgium suitable for nut and bolt making can be had delivered in the Black Country at £6 15s ($32.73) or a little less, and steel bars at the same price.

The shortage of basic pig iron which was a feature some time ago has been relieved and this together with some slowing down at Welsh steelworks has reduced the demand for heavy steel scrap which tends to weakness. It is quite probable, however, that this phase of the market will quickly pass as reports from South Wales indicate more activity within the last few days.

The Staffordshire finished iron trade is steadily engaged without any pressure at the mills. The position is not strong enough for makers to pass on to consumers the constant increases in fuel and pig iron. Marked bars still sell at £12 ($58.20) a ton and as that price has been established for many months consumers have no doubt been encouraged to make more use of this high quality Staffordshire iron. Manufacturers of wrought iron tube strip are endeavoring to stabilize the price at £11 2s 6d ($53.95) or 2s 6d ($0.60) above what they have been accepting during the last month or two, but consumers are not taking readily to the advance.

Though the tin plate market is stronger, consumers are reluctant to pay the price of 18s 9d ($4.55) quoted in many quarters and most of the business done during the week has been from that figure down to 18s 6d ($4.49). Output has improved considerably as a number of mills have completed enforced terms of idleness under the restriction scheme operating in South Wales.

Galvanized sheet makers have found a gradual improvement in inquiry and orders, and while the market is not strong enough to stand an official advance a number of makers are taking business at prices well above the £13 7s 6d ($64.86) basis.

Belgian Steel Market Quiet But Prospects Are Bright for Future

BRUSSELLS, Sept. 3.—(*European Staff Service*)—Quiet prevails on the Belgian iron and steel market and there is little change in price quotations. There is a certain optimism, however, as regards prospects from September onwards, and it is generally believed that prices will not further deteriorate. Pig iron prices for September are unchanged, but the Western European pig iron entente has decided to raise prices as from Oct. 1. Foundry pig iron, 2.5 to 3 per cent silicon, will be fixed at from 625 francs to 650 francs ($17.40 to $18.10), according to point of delivery. For export, the price has dropped to about £3 10s ($17) f.o.b. Antwerp, against £3 12s ($17.45), which had been ruling previously. Basic pig iron continues to be quoted around £3 10s ($17).

There are signs of revival in semi-finished steel and demand, although spotty, is gaining in intensity. Two-inch billets are offered at £4 16s ($23.25) to £4 17s ($23.50) and sheet bars being about the same prices. Large transactions are reported to have been effected by German sellers.

Merchant bars find difficulty in improving but prices have dropped only about 6d (12.00c) a ton since the previous week. A premium of 1s (24.00c) a ton can be secured for prompt shipment. Beams continue depressed and are offered at £5 2s ($24.75) for normal sizes; British sizes are 3s ($0.73) more per ton. Angles are quoted at £5 6s to £5 8s ($25.60 to $26.20) for sizes 3 inches and above, and between £5 11s and £5 12s ($26.80 to $27.10) for smaller sizes.

Demand for wire rod has expanded and mills are better placed for orders; the syndicate has fixed the basis price of £6 5s ($30.25) f.o.b. Antwerp, this applying to rods from 5 to 5.5 millimeters. Since the dissolution of the hoop and band syndicate, prices show rather wide fluctuations and are now about £5 17s 6d ($28.45). Export demand for wire products leaves much to be desired and the market is weak: bright wire is quoted at £7 10s ($36.25), galvanized wire at £9 12s 6d ($46.60) and wire nails at £9 ($38.80).

The plate market is firm and the volume of orders has improved. The current quotation for ¼-inch plates is about £6 5s ($27.40). The sheet market also is strong and some makers are booked over three or four months. Black sheets 24 gage are about £11 ($48.25). The galvanized sheet market also remains firm.

Luxemburg Makes Record

Luxemburg, Sept. 3.—(*European Staff Service*)—A new record has been reached by the Luxemburg iron and steel industry in its production of iron and steel during July. The output of pig iron was 250,260 metric tons, compared with 247,863 tons, the previous high mark, reached in May. July output was composed of 247,295 tons of basic bessemer pig iron, 2950 tons of foundry pig iron and 15 tons of gray forge pig iron.

In July the output of steel ingots and castings was 235,241 metric tons, against 229,620 tons the previous high mark reached in May. The July output was composed of 232,807 tons of basic bessemer steel, 2344 tons of open-hearth steel and 90 tons of electric steel.

Mon. ave.	Furnaces on last day	Pig iron	Steel ingots and castings
1913	....	212,320	111,355
1926	40	209,295	186,980
1927	39	227,710	200,595
1928	38	230,840	214,315
1929			
Jan.	38	241,639	224,617
Feb.	38	209,207	195,888
March	38	237,039	221,370
April	38	235,077	226,098
May	38	247,863	229,620
June	38	242,020	218,634
July	38	250,260	235,241

Better French Practice Increases Output

Paris, Sept. 3.—(*European Staff Service*)—Output of pig iron of the Societe Metallurgique de Normandie during 1928 was 307,453 metric tons, compared with 278,841 tons in 1927. The company's output of steel was 367,452 metric tons, against 355,535 tons the preceding year. The increase in production of pig iron was obtained with the two existing furnaces, due to special methods of operation. A third blast furnace stack is under construction.

The concern is a member of the European steel entente, and is free to develop its production of steel without penalty up to 400,000 metric tons a year.

British Prices Higher

London, Sept. 3.—(*European Staff Service*)—Board of trade returns for July give the average British export prices per gross ton for several iron and steel products. These prices are compiled from actual contracts which were made several months ago, and this accounts for the difference between these quotations and the base prices regularly quoted in our columns.

Compared with those of the preceding month, prices in July this year showed an increase, except for rails, plates and galvanized sheets, which were lower. In comparison with those of a year ago, prices were higher, except for rails and plates.

	£	s	d	$
Foundry pig iron	4	0	1	19.42
Beams	9	8	4	45.67
Rails	8	2	1	39.30
Black sheets under ⅛-inch thick	12	7	1	59.92
Galvanized sheets	15	18	1	77.13
Tinplates	20	1	11	97.46
Plates	9	11	10	46.52

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

DANBURY, CONN.—Ball & Roller Bearing Co., which recently leased the first floor of the building formerly occupied by the Heim Grinder Co., is considering additional space on the second floor for increased capacity.

WASHINGTON—District commissioners have awarded contract for remodeling the power plant at Gallinger hospital to the Rust Engineering Co., District National Bank building. Estimated cost $46,450. (Noted Aug. 29.)

BOSTON—Warren Foundry & Pipe Co., 201 Devonshire avenue, has plans for the construction of a foundry and warehouse addition. French & Hubbard, 210 South street, Boston, are engineers.

BOSTON—Edison Electric Co., 39 Boylston street, is having plans prepared for the construction of a boiler house, 140 x 140 feet, on Kneeland street. Whidden Beekman Engineering Co., 100 Arlington street, is engineer.

WEST CHELMSFORD, MASS.—Health Products Corp. of America, recently incorporated to take over the equipment and assets of the RDK Corp. of America, manufacturer of therapeutic devices, advises through P. V. Lundberg, general manager, it will lease temporary quarters pending further expansion.

WORCESTER, MASS.—M. J. Whittall Associates have awarded contract to the Morton C. Tuttle Co., 31 St. James street, Boston, for a power house, 85 x 110 feet, which will house four boilers.

AUBURN, N. Y.—Mercy hospital, care Dr. L. F. Oneil, chairman of the building committee, plans construction of a hospital building, including a power plant on Thornton avenue. Hillger & Beardsley, Seward building, are architects. (Noted Sept. 5.)

ELMIRA, N. Y.—American LaFrance & Foamite Corp., manufacturer of fire extinguishing equipment, plans construction of a 1-story plant and office building estimated to cost $50,000. Haskell & Considine, Hulett building, are architects.

JAMESTOWN, N. Y.—Excel Metal Cabinet Co. Inc. has awarded the contract for a 1-story plant addition, 75 x 180 feet, to Paddock & Nash, Jamestown. Hugo Lindgren is president.

NEW YORK—American All Metal Awning Shutter Corp., care L. A. Cuvillier, 179 East 121st street, advises through Frank J. Schafer, it will lease a building for the present and will require sheet metal equipment. (Noted July 18.)

NEW YORK—Union Railway Co., 2396 Third avenue, has filed plans for a 1-story addition, 34 x 192 feet, to its machine and blacksmith shop on West Farms road. E. H. Faile & Co., 441 Lexington avenue is engineer. Estimated cost about $30,000.

PHILADELPHIA—Philadelphia Business Progress association, R. H. Horton executive director, care mayor's office, city hall, has plans for the construction of an air-marine-rail terminal at Hog Island. Estimated cost of the project is about $6,125,000.

PITTSBURGH—Pennsylvania College for Women, Woodland road, has awarded the contract for the construction of a power plant at Fifth street and Woodland road, to W. F. Trimble & Sons, 1719 Pennsylvania avenue. Estimated cost $40,000.

RIDLEY PARK, PA.—Chester Auto Parts & Machine Co., Chester pike, awarded contract for a 1-story plant addition to M. Chester Campbell, 111 Market street. Estimated cost $25,000.

East Central

CHICAGO—Gary Screw & Bolt Co., 2217-57 West Forty-third street, has been issued a permit for the construction of a 1-story shop, 40 x 45 feet.

CHICAGO—Victor Products Corp., 2635 Belmont avenue, manufacturer of screw machines, has been issued a permit for the construction of a 2-story plant addition, 50 x 123 feet.

CHICAGO—Faith Mfg. Co., 2531 North Ashland avenue, manufacturer of die castings, is taking bids for the construction of a 2-story plant addition.

CHICAGO—Inter-State Aviation Corp. is contemplating establishing an airport on a 174-acre tract between Irving Park boulevard and the Chicago, Milwaukee, St. Paul & Pacific railroad right-of-way. Three hangars, 100 x 300 feet, are included in the plans estimated to cost about $200,000. Godfrey E. Larson, 5154 North Clark street, is architect.

CHICAGO—Norton Co., Worcester, Mass., manufacturer of grinding equipment and abrasive materials, has plans for the construction of a 1-story plant, on a site, 160 x 285 feet, at Turner avenue and Forty-seventh place in the Central Manufacturing district. Mundie & Jensen, 39 South LaSalle street, are architects.

PEORIA, ILL.—Peoria Casket Co., 209 Hamilton street, is having plans prepared for the construction of a two or 3-story casket plant estimated to cost about $75,000. Probably mature this fall.

QUINCY, ILL.—Gardner-Denver Co., manufacturer of pumps, tools, air compressors, etc., has awarded contract for an addition which will increase its production 50 per cent. (Noted June 20.)

CRAWFORDSVILLE, IND.—Lewis Shepard Co., Watertown, Mass., manufacturer of lift trucks, has purchased a manufacturing building here containing about 60,000 square feet, which will be used to manufacture skid platforms and storage racks for the present.

FT. WAYNE, IND.—Capehart Automatic Phonograph Co. plans construction of a 1-story plant addition estimated to cost about $35,000.

KOKOMO, IND.—Haynes Stellite Co., South Linsay street, manufacturer of alloys, tools, etc., is receiving bids for construction of a new foundry building to be erected this fall. Machinery and equipment will be added. The expansion program also includes a warehouse extension.

VALPARAISO, IND.—Acco Corp., 351 South Franklin street, advises it is in the market for woodworking machinery quotations. M. R. Marckwardt is president. (Noted Sept. 5.)

BRONSON, MICH.—L. A. Darling Mfg. Co., manufacturer of metal display fixtures, advises it will award a contract for the construction of a 2-story plant addition, 100 x 128 feet,

(*Continued on Page* 771)

Machinery

Market Maintains Moderate Pace—Proximity of Machinery Show Has Tendency to Defer Awards—Railroads Coming to Life

NO MARKED advances or recessions have been made by machinery sales during the past week, a widespread demand and a steady volume of small awards tending to keep the market going along smoothly. Opinion of most interests is that sales will pick up after the machinery exposition in Cleveland, two weeks hence. A few large lists are outstanding, New York Central railroad buying about 14 tools for its new Harmon, N. Y., plant; two new power house projects requiring about 12 tools each; and Western Electric Co. placing a few more tools on its $40,000,000 program for the Hawthorne and Baltimore works. Small machine shops are moderately good buyers. Lathes, radial drills, shapers, brakes and grinding machinery lead in sales in the East.

New York, Sept. 17.—While in spots machine dealers and builders report some slight decline in buying and inquiry, this situation is not general and volume of sales thus far in September is far ahead of last year. Demand is well spread. Delivery shows little improvement, although machine building plants are operating extra shifts. Grinding machinery generally can be delivered in four to five weeks. Standard machinery rarely can be delivered before eight weeks and longer in some instances. Boring machines and special equipment cannot be promised for months. While buying of one and two units has been numerous, including repeat orders, a few buyers are asking figures on larger lists. Lathes, radial drills, shapers, brakes and grinding machinery lead in sales. Ball bearing plants are reported slightly less active, although makers of machine motors hold to the high rate of recent months.

New York Central is buying equipment for its new Harmon, N. Y., plant, about 14 tools being involved, including lathes, drills, a shear and shapers. Two power house projects, one at Philadelphia and another in Ohio, will require about 12 tools each. Shapers, radial drills and lathes make up the bulk of the list. Western Electric placed several tools and General Electric still has a fair total to be placed against recent large inquiry. Except in grinding machinery, airplane engine builders are not so active. Used tools in good condition are few. Small machine shops are buying fairly well.

Worcester, Mass., Sept. 17.—Taking up a slight recession noted in August, machinery production is stepping up, especially in grinding machines. A large order was reported during the week from European markets supplementing an increasing steady demand from home sources, notably tractor and electrical industries. The coming Cleveland machinery exposition is attracting high interest among New England machinery builders.

Pittsburgh, Sept. 17.—New inquiry for machinery is less active but a large volume of work is pending and current awards are holding to better than the usual seasonal level. Purchases so far this month for a number of makers are equal to the August rate although there is a tendency to defer awards until next month. A large volume of work is pending in the crane market although considerable of this is expected to be held over until next year.

Chicago, Sept. 17.—Machine tool sales are maintaining a volume similar to August, and moderate scattered inquiry is reported. Inquiries on the whole are produced without preliminary information and are closed quickly. Further orders are reported from International Harvester Co. for its Farmall tractor works, at Rock Island, Ill. Work distributed by Western Electric Co. is requiring additional equipment for smaller plants engaged on that program. Western Electric Co.'s own program of equipment, for the Hawthorne works here and for the new Baltimore plant, has been estimated at $40,000,000, a large part of which already has been closed. Elgin, Joliet & Eastern railroad took bids yesterday on a 20-inch backgeared upright drill, and other roads in this territory are preparing inquiries of a small number of tools each. Sales of lathes and shapers continue active. Interest is active for used tools, but dealers have much lighter stocks of used equipment than a year ago. Shipments of new tools this month are expected to be high.

Cleveland, Sept. 17.—Machinery interests in this territory will be thankful when the various shows and their attendant rush and confusion are a thing of the past. A lull in inquiry and purchases always accompanies these exhibits and this year is no exception, although one dealer reports a plentiful supply of inquiries for one and two items. Equipment for the new city and tractor plant which the Soviet government is erecting in Russia furnishes business to many dealers from time to time. The total value of this material is estimated at $100,000,000 and is being placed through the Amtorg Trading Corp., New York. This organization has been placing to the extent of about $15,000,000 worth of equipment yearly, approximately one-third of the total already having been awarded.

CRANE ORDERS PLACED

Two 150-ton 5-motor cranes for Standard Oil Co. of New Jersey, New York, to Whiting Corp.

CRANE ORDERS PENDING

One or 1¼-yard gasoline operated crawler shovel for D. W. Stewart, Bennettsville, S. C. Inquiry issued.

Crane Orders Decrease

New York, Sept. 17.—According to figures released by the Electric Overhead Crane institute, August shipments of cranes totaled 140 units, compared with 145 in July. Tonnage capacity of these units was 1758 and value was $1.059,946.60. This compared with 1873½ tons capacity and $1.146 264 valuation in July.

New orders were 121 with a tonnage capacity of 1697½, valued at $1.164,946.95. New orders in July were slightly higher, 126, tonnage capacity 1780 and valued at $1,156,843 45.

Unfilled orders decreased somewhat from July, totaling 472 with a tonnage capacity of 7509½, valued at $5.192,751. The July figures were 494 units with a tonnage capacity of 7648¾, valued at $5,118,246.79.

Speed Algoma Additions

Toronto, Ont., Sept. 17.—Good progress is reported by the Algoma Steel Corp. on extensions to its 12-inch and 18-inch merchant mills, and the new mills, doubling the capacity of the present ones, are expected to be operating by Jan. 1. An increased output of 50,000 tons a year will be possible. New equipment includes modern reheating furnaces, especially adapted to take care of the special heating required for alloy and forging steels. Additional shearing and shipping facilities also are being provided.

August Hoist Orders Off

New York, Sept. 17.—Electric Hoist Manufacturers' association members report hoists ordered during August decreased 13 29 per cent as compared with July. The value of such orders, however, increased 6.19 per cent as compared with the previous month. Shipments during August were 17.14 per cent heavier as compared with July.

Construction and Enterprise

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to Frank L. Shoemaker, Sturgis, Mich. Plating equipment and conveyor elevators will be needed.

DETROIT—Wolverine Bolt Co., French road, has plans for the construction of a 1-story plant addition, 80 x 300 feet. Estimated cost about $75,000.

DETROIT—Detroit Stoker Co., General Motors building, advises it plans construction of a 2-story addition to its pattern shop also an addition to its foundry which will double the present capacity. (Noted Sept. 12.)

DETROIT—Hise Aircraft Corp., 5625 St. Clair avenue, advises it has not definitely decided upon a location for its proposed manufacturing plant, but will inform us upon completion of plans. (Noted Sept. 12.)

DETROIT—Morse Counterbore & Tool Co., 12281 Turner street, plans to open a branch plant in Los Angeles to be in operation in the latter part of the year, according to William S. Morse president.

DETROIT—Chevrolet Motor Co., general offices, 3044 West Grand boulevard, has awarded the general contract for a machine shop to be erected on St. Aubin street to the H. G. Christman-Burke Co., Fisher building.

DETROIT—Ring Screw Co., 2718 Milwaukee avenue, recently incorporated to manufacture screw machine products, advises it is leasing property at 1340 East Milwaukee avenue and purchasing necessary equipment.

FLINT, MICH.—City, care H. E. Hills, Harrison and Eighth streets, closed bids Sept. 10 for the construction of a 3-story warehouse and garage. Estimated cost $110,000.

HASTINGS, MICH.—Hastings Mfg. Co. advises through C. W. Nolan secretary, it is building a new plant for the manufacture of piston rings which will increase present production four times. Some new equipment will be purchased. (Noted Sept. 10.)

LANSING, MICH.—John Bean Mfg. Co., 735 Hazel street, awarded contract for a one and 2-story office and machine shop addition to H. G. Christman Co., 408 Kalamazoo plaza. (Noted Aug. 15.)

MUSKEGON, MICH.—Venton Steel Sash Co., Sixth street, is receiving bids for the construction of a 1-story plant addition, 60 x 130 feet. Estimated cost about $75,000.

PORT HURON, MICH.—United Brass & Aluminum Mfg. Co., South Park street, will rebuild portion of plant recently damaged by fire, according to Jacob Goldman, president. Estimated loss about $30,000.

SAGINAW, MICH.—Saginaw Foundries Co., 930 Water street, recently incorporated to take over the plant and business of the A. F. Bartlett Co., will add a steel foundry department before January. New equipment will be installed. Fred W. Stork is in charge of operations. (Noted Aug. 29.)

CINCINNATI—Tennessee Copper & Chemical Corp., Skillman road and Big Four tracks, has awarded contract for a plant addition to the Ferro Concrete Construction Co., Third and Elm streets. Estimated cost about $40,000.

CLEVELAND—National Screw & Mfg. Co., 2440 East Seventy-fifth street has been granted a building permit for the construction of a plant addition at 8230 Grand avenue.

CLEVELAND—Thorne-Hawk Body Co., 2102 East Twenty-second street, has leased a brick building at 3415 Lakeside avenue northeast, for additional manufacturing and warehouse space.

CLEVELAND—Wedge Thread Protector Co., 3407 Vega avenue southwest, has leased about 9000 square feet of space in a building under construction at 5208 Harvard avenue. John Rutkowski Inc. will use the remaining space for a machine shop. (Noted Aug. 1.)

DAYTON, O.—Burkett Closed Body Co., 541 Master avenue, which recently disposed of its plant building to the Master Electric Co., has acquired an option on a 10-acre tract, where it plans to build a 1-story plant at a cost of $200,000.

DAYTON, O.—Simonds, Worden & White, Summit and Negley avenues, manufacturer of knives, etc., plans enlarging its floor space for increased capacity.

DAYTON, O.—Dayton Power & Light Co., 20 South Jefferson street, has plans in progress for the construction of a 2-story power and light distributing station.

DAYTON, O.—Duro Co., 537 East Monument avenue, manufacturer of pumps, has plans for an expansion program under way, according to C. E. Burnett, president.

DAYTON, O.—Delco Products Co., general offices Third National Bank building, subsidiary of General Motors Corp., Detroit, will build a 5-story plant on Taylor road estimated to cost about $150,000.

SANDUSKY, O.—Eastern steel interests have taken an option on a 594-acre tract on the Huron river near Huron, O., as a site for a proposed steel plant and is also considering Sandusky as a possible location, according to Maj. C. B. Wilcox, general manager of the Ohio Public Service Co., Hanna building, Cleveland.

TIFFIN, O.—Sterling Grinding Wheel Co., closed bids Sept. 17 through the George S. Rider Co., Century building, Cleveland, for the construction of a 1-story plant addition.

KENOVA, W. VA.—Champion Switch Co. has plans for an expansion program which will double its present capacity. Estimated cost $25,000.

MADISON, WIS.—University of Wisconsin board of regents has placed the general contract with J. H. Findorff & Son, Madison, for the construction of the new mechanical engineering building at Madison, for $512,812. It will be 3 stories, 230 x 230 feet. Arthur Peabody is state architect.

MERRILL, WIS.—State industrial commission has approved plans by American Gas Construction Co., Minneapolis, for the proposed new gas producer plant and distribution system of the Oneida Gas Co. The cost has not been made public. W. E. Vaughn, Merrill, is general manager.

MILWAUKEE—Paul Realty Co. will build a new plant, shop and office at 457 Fifth street for the United Iron & Metal Co., to cost about $40,000 complete.

MILWAUKEE—Rundle Mfg. Co., manufacturer of enameled sanitary ware and plumbing supplies, has started work on a new material storage yard costing about $75,000 with conveyors and other equipment. A. A. Wickland & Co., Chicago, are consulting engineers.

RACINE, WIS.—Board of vocational education will be ready within a few days for bids for the construction of the new Racine vocational school building, 3 stories, 68 x 128 feet. Architect Frank J. Hoffman, James block, has completed plans. T. S. Rees is director.

SHEBOYGAN, WIS.—Board of water commissioners has accepted the several bids for the construction and equipment of the new municipal filtration plant. Boilers and stoker bids are still under consideration.

Southern States

BIRMINGHAM, ALA.—American Cast Iron Pipe Co., 2930 North Sixteenth street, has been issued a permit for the construction of a dust building and a core head building.

ATLANTA, GA.—Mueller Co., Decatur, Ill., manufacturer of plumbing and heating supplies, has started construction of a branch plant here, which will include a foundry and machine shop. (Noted Aug. 22.)

OKLAHOMA CITY, OKLA.—Oklahoma Gas & Electric Co., Oklahoma City, has plans for the construction of a 30,000-kilowatt steam-electric generating plant to be located on Belle Isle lake here, according to J. F. Owens, vice president and general manager of the company.

CHATTANOOGA, TENN.—Standard Coosa-Thatcher Co., Eighteenth street, has construction under way of a machine shop estimated to cost about $50,000 including equipment.

NASHVILLE, TENN.—Liberty Range Works Inc., which has been operating within the state prison here, has purchased property on Forty-eighth avenue, between Centennial boulevard and Tennessee avenue, upon which it will build a new plant. Estimated cost about $250,000.

ABILENE, TEX.—Quality Screen Co., recently incorporated, advises it is purchasing some new equipment for the manufacture of door and window screens.

BEAUMONT, TEX.—Kansas City Southern railroad has plans for construction of yard terminals including machine shop and roundhouse on a 125-acre site, to cost about $1,000,000.

BEAUMONT, TEX.—Beaumont Iron Works, 1450 Crockett street, has plans for improvements and alterations to its plant estimated to cost about $50,000.

COLEMAN, TEX.—City has voted $40,000 waterworks bonds for building of filtration plant and standpipe.

CORPUS CHRISTI, TEX.—Duval Texas Sulphur Co., subsidiary of the United Gas Co., Niels Esperson building, Houston, Tex., will soon start construction of a sulphur loading terminal. Estimated cost $300,000.

DALLAS, TEX.—Austin Bridge Co. has let contract for building of an all-metal 1-story building for manufacture of bridge piling.

DENTON, TEX.—City awarded contract for a power plant, 80 x 208 feet, to the Denton Construction Co. Estimated cost $40,000. (Noted July 25.)

HOUSTON, TEX.—Markle Steel Co. is having plans made for a 1-story shop addition, 100 x 129 feet. Giesche & Harris, Second National Bank building, are architects.

HOUSTON, TEX.—Parkersburg Rig & Reel Co. has acquired a site, 150 x 400 feet, on Navigation boulevard with probable view of expansion.

SAN ANTONIO, TEX.—Texas Machine & Foundry Co., 636 Rigsby street, has awarded contract for two machine shops on Harper

street, to the Brandt Iron Works, Colorado and Lombrano streets.

TEXARKANA, TEX.—Plant of Texarkana Machine Works, J. S. Young manager, was recently damaged by fire, with loss of $22,000.

WICHITA FALLS, TEX.—Orient Petroleum Co., Harvey Sinder building, is having plans prepared for the construction of a gasoline cracking plant estimated to cost about $250,000.

West Central

ROCHESTER, IOWA—Iowa Railway & Light Co., Dows building, Cedar Rapids, Iowa, contemplates constructing a hydroelectric plant on the Cedar river here. Fargo Engineering Co., 226 West Main street, Jackson, Mich., is engineer.

ST. LOUIS—Sunnen Products Co., 6417 Dale street, manufacturer of automobile accessories, has awarded contract for a plant addition to A. L. Sketters, Mexico, Mo. (Noted Aug. 8.)

ST. LOUIS—Central Brass & Aluminum Foundry Co., Twenty-first and Randolph streets, is erecting a 1-story addition, 33 x 59 feet.

GERING, NEBR.—The north wing of the Gering Foundry & Machine Co. plant was recently damaged by fire. Estimated loss about $15,000.

Western States

COOLIDGE, ARIZ.—Arizona Edison Co., Phoenix, Ariz., care W. C. Hornberger, will soon start construction of a power plant including diesel engines.

OAKLAND, CALIF.—Durant Motor Co. of Calif., 10910 East Fourteenth street, has plans for the construction of a plant addition estimated to cost about $50,000.

SAN FRANCISCO—U. S. Metal Products Co., 330 Tenth street, plans construction of a one and 2-story plant addition estimated to cost about $100,000. Ellison & Russell, Pacific building, are engineers.

GOLDEN, COLO.—Colorado state industrial school, care Claude B. Jones, superintendent, will soon take bids for a 2-story L shape industrial shop 60 x 100 and 40 x 60 feet.

HAWTHORNE, NEV.—Navy, care bureau of docks and yards, Washington, will receive bids until Oct. 2 for furnishing boiler plant equipment, refrigeration and ice making plants for the naval ammunition depot here.

BAKER, OREG.—California-Oregon Power Co., Medford, Oreg., has filed a petition for water rights with the view of expending about $6,500,000 in developing 54,560 horsepower on the Rogue river.

BREMERTON, WASH.—Puget Sound navy yard plans improvements totaling about $157,000. Included will be an extension to the crane tracks for the 50-ton cranes and a 1-story welded steel addition to the machine shop.

Canada

EDMONTON, ALTA.—Barry Sheet Metal Works, 10171 Seventeenth avenue, has awarded general contract to J. J. Doyle for the erection of a 1-story plant addition.

WINNIPEG, MAN.—Construction work will be started early next spring at the Fort Rouge yards of the Canadian National railways. New shops, roundhouse and yards will be included in the work, which will cost between $3,000,000 and $4,000,000.

ST. JOHN, N. B.—St. John Iron Works, subsidiary of the St. John Dry Dock & Shipping Co. Ltd., will build a foundry upon the site of the present Lower Cove plant.

HAMILTON, ONT.—The hydroelectric commission will build two substations in which equipment to cost $196,000 will be installed.

SAULT STE. MARIE, ONT.—Superior Alloys Ltd. has leased a site from the Algoma Steel Corp. here, and will start work at once on the erection of a plant to cost $75,000 for the manufacture of alloys for use in special grades of steel.

ST. CATHARINES, ONT.—General Motors Corp. of Canada, Oshawa, Ont., has awarded general contract to W. J. Trick Co., for the erection of an addition to the McKinnon Industries plant here to be, 136 x 425 feet, and cost $175,000. The plant will be used for the manufacture of Delco-Remy starting and lighting equipment. (Noted Aug. 22.)

SWANSEA, ONT.—N. L. Ivey, clerk, 107 Runnymede road, Toronto, Ont., is receiving bids for the erection of two sewage pumping stations on Queen street. Equipment will be purchased.

TORONTO, ONT.—Dominion Wheel & Foundry Co. has applied for a permit to build a $60,000 machine shop at 131 Eastern avenue. The company is at present erecting a foundry plant there.

LACHINE, QUE.—Bids are being received, no closing date set, by the Steel Co. of Canada Ltd., 525 Dominion street, for the erection of an addition to its plant here.

LONGUEUIL, QUE.—Bids will be called next week for the erection of a $300,000 plant here for the Fairchild Aircraft Ltd., 1253 McGill College avenue, Montreal, Que. Consulting engineer, W. H. Wardell, 1463 Union avenue, Montreal. The main building will be, 140 x 260 feet. (Noted Aug. 15.)

MOSSBANK, SASK.—Plans are being prepared for the rebuilding of the sodium sulphate plant of the Bishopric & Lent Co., Spring Grove and Estes avenues, Cincinnati. The plant was recently destroyed by fire with a loss of $500,000. (Noted Sept. 5.)

Recent Incorporations

BRIDGEPORT, CONN.—Oleson Aircraft Inc. has been incorporated with $100,000 capital to manufacture airplanes, by Svend Oleson. The plant is located in a building leased from the former Lake Submarine Co.

CHICAGO—Ewald Electric Construction Co., 5711 Iowa street, has been incorporated with 200 shares of no par stock to manufacture and build electrical devices, by Dorothy Ewald.

CHICAGO—Dawson Mfg. Co., 69 West Washington street, has been incorporated with $5000 capital to manufacture and sell valves of all kinds, by John E. Kelly.

CHICAGO—Apex Brass Foundry Co., 1925 Elston avenue, has been incorporated with $5000 capital to engage in the foundry and machine shop business, by Arthur Goldberg.

MOLINE, ILL.—Everedy Oil Burner Corp., Sahrbach building, has been incorporated with 10,000 shares of no par stock to manufacture and sell oil burners, by J. L. Brady.

COVINGTON, KY.—Covington Metal Products Co. has been incorporated with $10,000 capital to manufacture, buy and sell metal products, by George Miller, August and Nicholas Castellini.

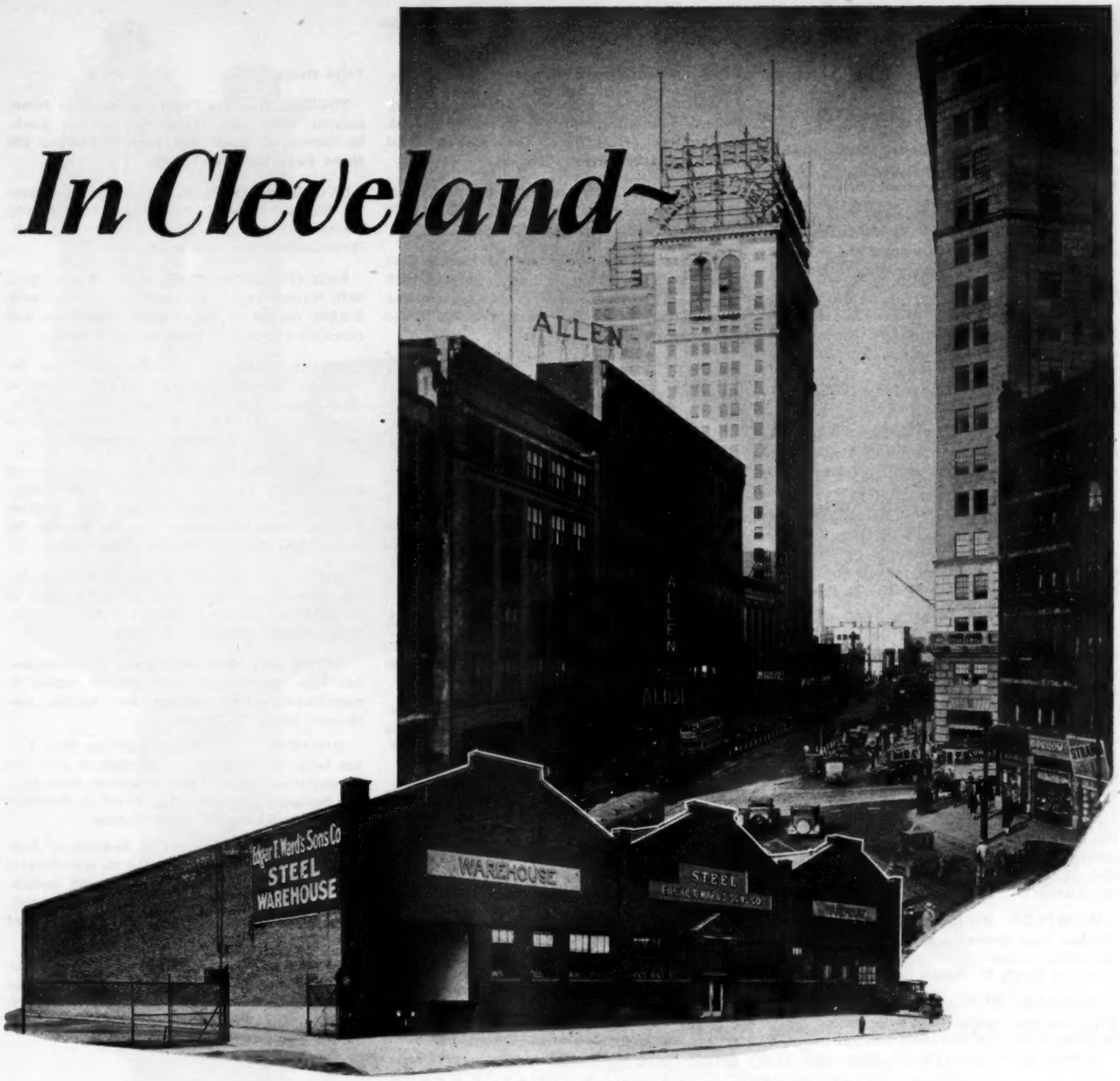
NEW ORLEANS—Service Foundry Inc. has been incorporated with $10,000 capital, by Morris J. Rabe, 3923 Orleans street.

ATTLEBORO, MASS.—Dennis & Hoyle Steel Treating Co. has been incorporated with 100 shares of no par stock to engage in the steel treating business. Abraham Hoyle, 494 Plainfield street, Providence, R. I., is president.

BOSTON—National Radio Corp. has been in-

(*Concluded on Page* 774)

In Cleveland~



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CHICAGO, 1455 W. 37th St.
DETROIT, 1300 Fort St., West
NEWARK, 400 Frelinghuysen Ave.
NEW YORK, 373 Pearl St.
MILWAUKEE, 57 Ave. and Burnham St.
PHILADELPHIA, Cedar and Westmoreland Streets.

The World's Largest Distributors of Fine Steel Products

Construction and Enterprise

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corporated with $50,000 capital to manufacture and deal in radios and radio equipment. Charles P. Abbott, 1209 Boyleston street, is president.

BOSTON—Connolly Motor Sales Inc. has been incorporated with $40,000 capital to manufacture and deal in motors, engines and other devices. James H. Connolly, Hyannis, Mass., is president.

CAMBRIDGE, MASS.—Enterprise Mfg. Co. has been incorporated with 1000 shares of no par stock to manufacture and deal in copper boilers, fire pumping apparatus, etc. Stanley K. Lander, 169 Winchester street, Brookline, Mass., is president.

CHELMSFORD, MASS.—Health Products Corp. has been incorporated with $20,000 capital to manufacture and install machinery, appliances and equipment of all kinds. Paul V. Lundberg, West Chelmsford, Mass., is treasurer.

DETROIT—Peerless Tool Co., 523 Vinewood avenue, has been incorporated with 500 shares of no par stock to engage in general tool and machinery manufacturing by Otto A. Rasch.

DETROIT—Lincoln Tool & Die Co., 1498 Twenty-third street, has been incorporated with $40,000 capital to manufacture and sell machinery, tools and operate a machine shop, by D. W. Heaslip.

DETROIT—Piquette Motor Service Inc., 6060 John R. street, has been incorporated with 10,000 shares of no par stock to operate a general motor service business, by Harry E. Hagquist.

KALAMAZOO, MICH.—Cavanaugh Auto Body Co. Inc., 335 North Rose street, has been incorporated with $25,000 capital to engage in general repair work and operate a garage, by J. M. Shackleton.

MUSKEGON, MICH.—Muskegon Construction Co. has been incorporated with 100,000 capital to engage in general building and construction work, by Ralph D. Ballew.

REPUBLIC, MICH.—Koeber Iron Ore Mining Corp. has been incorporated with $00,000 capital to operate iron ore and other mineral mines, by Edward Koeber Sr., 59 East Lake street.

CAMDEN, N. J.—Philadelphia Metal Stamping Co. has been incorporated with $50,000 capital, by the New Jersey Corp. Guarantee & Trust Co., 304 Market street, Camden.

CARTERET, N. J.—Manufacturers Electric Plating Co. has been incorporated with $125,000 capital, by Emil Streamlau, Carteret.

CEDAR GROVE, N. J.—Stanifeld Electric Construction Co. Inc. has been incorporated with $50,000 capital to engage in the contracting business, by Walter R. Whitehurst, 790 Broad street, Newark, N. J.

NEWARK, N. J.—Parkway Construction Co. has been incorporated with $125,000 capital to engage in the contracting business, by Meisterman & Katchen, 786 Broad street, Newark.

NEWARK, N. J.—American Tool & Stamping Co. Inc. has been incorporated with $100,000 capital, by Patrick J. Maloney, 9 Clinton street, Newark.

PATERSON, N. J.—Enterprise Brick Works Inc. has been incorporated with $200,000 of preferred and 2000 shares of common stock, by Evans, Smith & Evans, 5 Colt street, Paterson.

SAUGERTIES, N. Y.—Rondack Mfg. Corp. has been incorporated with $50,000 capital to operate a machine shop, by F. I. Sleaster, 522 Fifth avenue, New York.

GREENSBORO, N. C.—W. P. Christian Inc. has been incorporated with $100,000 capital to operate an electric motor repair shop, by W. P. Christian, 718 Percy street.

ATHENS, O.—Taylor-Sherrard Machine Works Inc. has been incorporated with $25,000 capital, by Dave R. Taylor.

CLEVELAND—Universal Pump & Tank Corp. has been incorporated with $200,000 capital, by H. B. Howells, Williamson building.

CLEVELAND—Lakewood Stamping & Mfg. Co., 13000 Athens avenue, has been incorporated with $10,000 capital to engage in a general job stamping business, by J. B. Hope.

COLUMBUS, O.—Kaiser Sheet Metal Works Inc. has been incorporated with 250 shares of no par stock, by George H. Kaiser, 264 North Third street.

TOLEDO, O.—City Forge Co. has been incorporated with 1000 shares of no par stock, by Henry R. Bloch and Leroy Eastman, 906 Home Bank building, Toledo.

OKLAHOMA CITY, OKLA.—Automotive Service Works has been incorporated with $30,000 capital to operate a machine shop, by J. B. Worthington, 806 West Main street.

PHILADELPHIA—Torch Iron Works Inc., 3610 Wallace street, has been incorporated with $10,000 capital to manufacture, fabricate and assemble ornamental iron, by Jacob Ment.

PITTSBURGH—Carnegie Forge & Tool Co. has been incorporated with $25,000 capital to manufacture and deal in metal products, forgings, tools, etc. Allen H. Kerr, 1108 Commonwealth building, Pittsburgh, is treasurer.

PITTSBURGH—Pennsylvania Pipe Thread Protector Co. has been incorporated with $50,000 capital to manufacture and deal in pipe, fittings, thread protectors, etc., by Maurice M. Cavitt, 806 Heberton avenue, Pittsburgh.

SCRANTON, PA.—U. S. Textile Machine Co. has been incorporated with $25,000 capital to manufacture textile machinery. Abe Jermyn, Hotel Jermyn, Scranton, is treasurer.

GREEN BAY, WIS.—Helgerson Foundries Inc. has been incorporated with $25,000 capital to manufacture steel castings and special machinery, by L. E. Jonte.

TORONTO, ONT.—Salter Lighting Mfg. Ltd. has been incorporated to manufacture and deal in electrical fixtures and apparatus with $40,000 capital, by Harry Salter, David B. Goodman and Monia Richmond, all of Toronto.

TORONTO, ONT.—Colin B. Kennedy of Canada Ltd. has been incorporated to manufacture and deal in machinery, apparatus and devices, with $125,000 capital, by Charles H. C. Leggott, Harry L. Wright, and Jessie M. Perry, all of Toronto.

MONTREAL, QUE.—B. W. Fromson Ltd. has been incorporated to carry on the business of building contractors, with a capital of $50,000, by Lazarus Phillips, Lionel A. Sperber and Harry Blanshay, all of Montreal.

New Trade Publications

STEEL CASTINGS—A bibliography of its steel castings publications forms the subject matter of a bulletin by the Nugent Steel Castings Co., Chicago. The list includes the various bulletins issued by this company, bearing on steel castings and their value and use.

REFRACTORIES—Advantages from use of refractories made by Laclede-Christy Clay Products Co., St. Louis, are set forth in a current bulletin. The value of 85 years of experience in this line of manufacture is one of the reasons emphasized.

SHEARS, PUNCHES AND PRESSES—Henry Pels & Co. Inc., New York, has issued two bulletins, one devoted to heavy shears and presses and the other to combination shears and punches. Each is illustrated to show the machines and the work they are capable of performing. Details of working parts are presented.

FOUNDRY OVENS—Gehnrich Oven Co. Inc., Long Island City, N. Y., is distributing a bulletin on foundry ovens. It discusses features of construction of various types of core baking and mold drying ovens and also those designed for aging and normalizing castings. It is illustrated to show installations of this class of equipment.

MACHINE DESIGN—Jones & Lamson Machine Co., Springfield, Vt., has issued a folder containing a number of loose-leaf halftone illustrations of machines and production operations on lathes. Attention is called to the progress of machine design and its development for varied uses. The text for the material is "The proper machine for the job."

PUMPS AND FANS—Duriron Co. Inc., Dayton, O., has issued two bulletins, one devoted to a centrifugal pump for use with solutions offering mechanical and chemical difficulties. The other covers fans for use in exhausting gases from laboratory hoods, pickling rooms and other places where corrosive fumes must be removed. They are designed to resist the effects of these gases on the fans. Illustrations and diagrams are presented, with data tables of capacities and efficiencies.

HEAT TREATING—Case Hardening Service Co., Cleveland, has prepared a loose-leaf catalog for its patrons, supplied with pages covering its several products. It provides for adding or replacing bulletins. Products covered include case hardening compounds, drawing salts, hardening and annealing salts, anticarburizing paint, pots, laboratory and toolroom equipment, furnaces, and testing machines.

EXHAUSTERS—Connersville Blower Co., Connersville, Ind., in a current bulletin shows the use of its rotary exhausters for use in the gas and by-product coke industry. It presents a description of the general operating principle of the company's exhausters and a basis on which to determine the values of service, the bearing construction and other features, and illustrations of various types and arrangements of exhausters.

Model 24-P ejection type press, having box 100" long, 20" wide, 42" deep. Finished bales measure 20" x 14" x 14" minimum. Can be equipped with power operated loading hopper

LOGEMANN
SCRAP METAL PRESSES

Hydraulically compressed scrap commands at all times the *best price*, and can be conveniently stored and held for favorable markets; it is easily handled; it practically eliminates corrosion; it saves much time in remelting; cars can be easily loaded to capacity.

***LOGEMANN Presses* are built in several types and sizes to suit all requirements.**

You cannot go wrong on a LOGEMANN—it's a money maker from the day it is set in operation.

PIONEERS!

LOGEMANN Scrap Metal Presses, pioneers in this industry, enjoy an enviable reputation for long life and economical operation. They are in daily use in practically every large sheet mill, stamping plant, scrap yard, and in metal-working establishments of all kinds.

Our many years of accumulated experience, and services of our Engineering Department are at the disposal of all plants accumulating metal scrap of any kind.

LOGEMANN BROTHERS COMPANY, 3126 Burleigh St., MILWAUKEE, WIS.

Pipe and Tube Prices—Plate Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

To large jobbers these discounts are increased by 1 point and two supplementary discounts of 5 per cent on black, and 1½ points and two supplementary discounts of 5 per cent on galvanized.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

	Black.	Galv.
⅛ and ¼-inch	+11	+36
⅜-inch	23	5
½-inch	28	11
¾-inch	31	15
1 and 1¼-inch	35	18
1½ and 2-inch	35	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+13	+48
½-inch	23	7
¾-inch	28	12
1 to 2-inch	34	18

Lap Weld

2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

Jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized wrought iron pipe.

On extra or double extra strong pipe fitted with threads and couplings basing discount lowered 5 points from plain end price. Fitted with threads only, basing discount lowered 3 points for random lengths.

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ to 3¾-inch	56 off
4-inch	59 off
4½ to 6-inch	48 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. Over 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2¼-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¼ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discount reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	63 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48 off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	42 off

SEAMLESS HOT ROLLED

1¾-inch	39 off
2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Net prices per foot f.o.b. Pittsburgh Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for lengths over 24 feet.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{3}{16}$-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot	.20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{3}{16}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds square foot	.20c
Plates ordered 7.65 pounds square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, classes A-B	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection ..... No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c